



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

100 North Senate Avenue
Room N758
Indianapolis, Indiana 46204-2216 (317) 232-3166 FAX: (317) 232-0238

Mitchell E. Daniels, Jr., Governor
Michael W. Reed, Commissioner

January 20, 2010

Adam Jackson
Water Quality Certification Section
Kentucky Division of Water
200 Fair Oaks Lane
Fourth Floor
Frankfort, KY 40601

RE: US 421 Milton-Madison Bridge Design Build Project
Des. 0501151
Trimble County, KY

Dear Mr. Jackson:

Attached is an Application for Water Quality Certification.

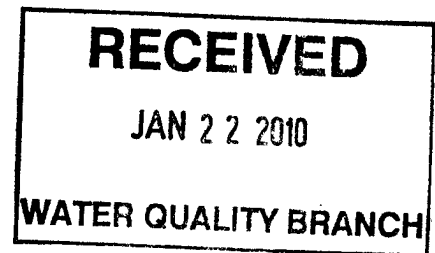
The 404 permit application and the Application to Construct Across or Along a Stream permit are being sent to USACE and Jim Oerther of KDOW. Should you have any questions please contact me at 317-232-5018 or Li Kang, the permit coordinator, at 317-232-6766.

Sincerely,

Laura Hilden
Permits Supervisor

Cc: Morris, Gina
Carr, John L
Hetrick, Kevin
Permits file

LEH/lk



COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES & ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER

APPLICATION FOR PERMIT TO CONSTRUCT ACROSS OR ALONG A STREAM
AND / OR WATER QUALITY CERTIFICATION

Chapter 151 of the Kentucky Revised Statutes requires approval from the Division of Water prior to any construction or other activity in or along a stream that could in any way obstruct flood flows or adversely impact water quality. If the project involves work in a stream, such as bank stabilization, dredging or relocation, you will also need to obtain a 401 Water Quality Certification (WQC) from the Division of Water. This completed form will be forwarded to the Water Quality Branch for WQC processing. The project may not start until all necessary approvals are received from the KDOW. For questions concerning the WQC process, contact the WQC section at 502/564-3410.

If the project will disturb more than 1 acre of soil, you will also need to complete the attached Notice of Intent for Storm Water Discharges, and return both forms to the Floodplain management Section of the KDOW. This general permit will require you to create an implement an erosion control plan for the project.

1. OWNER: Laura Hilden, IN Department of Transportation, Office of Environmental Services
Give name of person(s), company, governmental unit, or other owner of proposed project.

MAILING ADDRESS: 100 N. Senate Avenue, Room N 642
Indianapolis, IN 46204

TELEPHONE #: 317-232-5018

EMAIL: lhilden@indot.in.gov

2. AGENT: Third Rock Consultants, Gina Morris, PG
Give name of person(s) submitting application, if other than owner.

ADDRESS: 2526 Regency Rd Suite 180
Lexington, KY 40503

TELEPHONE #: 859-977-2000 (office), 859-433-7504 (cell)

EMAIL: gmorris@thirdrockconsultants.com

3. ENGINEER: John L. Carr P.E. NUMBER: 10205
Contact Division of Water if waiver can be granted.

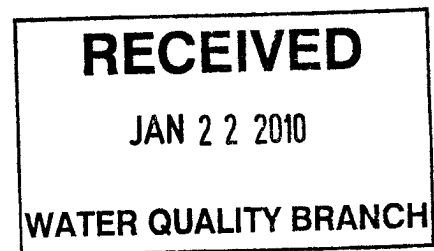
TELEPHONE #: 859-244-8880 EMAIL: jcarr@wilbursmith.com

4. DESCRIPTION OF CONSTRUCTION: The superstructure of the US 421 Milton-Madison Bridge between Milton, KY and Madison, IN will be replaced to maintain connectivity and improve safety. Two existing piers below OHW (plus a third pier on the Indiana side of the river) will be strengthened by increasing the pier size above the river substrate. One existing pier on the Indiana side will also be removed to the river bottom. Jet grouting will be installed in the river substrate around the strengthened piers, and riprap will be placed over the jet grouting to provide scour mitigation. Temporary cofferdams will be constructed around the piers. Temporary ferry landings on each bank of the river will require some dredging to allow ferry operation during bridge closure (approximately 12 months). Temporary work platforms (causeways) will also be constructed on each bank of the river.

For further description of the construction and demolition activities refer to the attached narrative.

Describe the type and purpose of construction and describe stream impact

5. COUNTY: Trimble, KY NEAREST COMMUNITY: Milton, KY
6. USGS QUAD NAME Madison East LATITUDE/LONGITUDE: N 38.73 W 85.37
7. STREAM NAME: Ohio River WATERSHED SIZE (in acres): > 1,000
8. LINEAR FEET OF STREAM IMPACTED: Permanent Impacts: approx. 138ft of channel length at Piers 3 and 4 due to scour mitigation. Temporary Impacts: approx. 160ft at temporary causeway and approx. 70ft at temporary ferry landing.



9. **DIRECTIONS TO SITE:** From Louisville, take I-71 north to Campbellsburg (US 421). Take US 421 to bridge over Ohio River.
10. **IS ANY PORTION OF THE REQUESTED PROJECT NOW COMPLETE?** ☐ Yes ☒ No If yes, identify the completed portion on the drawings you submit and indicate the date activity was completed. DATE: _____
11. **ESTIMATED BEGIN CONSTRUCTION DATE:** 6/1/10
12. **ESTIMATED END CONSTRUCTION DATE:** 2/15/12
13. **HAS A PERMIT BEEN RECEIVED FROM THE US ARMY, CORPS of ENGINEERS?** ☐ Yes ☒ No If yes, attach a copy of that permit.
14. **THE APPLICANT MUST ADDRESS PUBLIC NOTICE:**
(a) **PUBLIC NOTICE HAS BEEN GIVEN FOR THIS PROPOSAL BY THE FOLLOWING MEANS:**
____ Public notice in newspaper having greatest circulation in area (provide newspaper clipping or affidavit)
____ Adjacent property owner(s) affidavits (Contact Division of Water for requirements.)
(b) X **I REQUEST WAIVER OF PUBLIC NOTICE BECAUSE:**
The NEPA process has included significant public involvement.
Contact Division of Water for requirements.
15. **I HAVE CONTACTED THE FOLLOWING CITY OR COUNTY OFFICIALS CONCERNING THIS PROJECT:**
Randy Stevens, Judge-Executive for Trimble County; Denny Jackson, Mayor of Milton; Shannon Hoskins, Milton City Administrator; Tim Armstrong, Mayor of Madison; Madison Parks and Recreation Department. Also, the Trimble County Fiscal Court is on the Project Advisory Group (PAG) and has been involved throughout the project development process.
Give name and title of person(s) contacted and provide copy of any approval city or county may have issued.
16. **LIST OF ATTACHMENTS:** Narrative of Construction and Demolition Activities, Project Location Topo, Construction Schematic, Aerial of Pier Mitigation Area, Aerial of Kentucky Ferry, Table of Temporary and Permanent Impacts to Riverbed, Topo Photo Orientation Map and Photo Log, Diagrams of Scour Countermeasures, Sediment Basin Details, EA Report
List plans, profiles, or other drawings and data submitted. Attach a copy of a 7.5 minute USGS topographic map clearly showing the project location.
17. **I, Laura Hilden (owner) CERTIFY THAT THE OWNER OWNS OR HAS EASEMENT RIGHTS ON ALL PROPERTY ON WHICH THIS PROJECT WILL BE LOCATED OR ON WHICH RELATED CONSTRUCTION WILLOCCUR** (for dams, this includes the area that would be impounded during the design flood).
18. **REMARKS:** _____

I hereby request approval for construction across or along a stream as described in this application and any accompanying documents. To the best of my knowledge, all the information provided is true and correct.

SIGNATURE: LDH

(Owner or Agent sign here. (If signed by Agent, a Power of Attorney should be attached.)

DATE: 1/20/2010

SIGNATURE OF LOCAL FLOODPLAIN COORDINATOR: _____

Permit application will be returned to applicant if not properly endorsed by the local floodplain coordinator.

DATE: _____

SUBMIT APPLICATION AND ATTACHMENTS TO:

Floodplain Management Section
Division of Water
14 Reilly Road
Frankfort, KY 40601

151.250 Plans for dams, levees, etc. to be approved and permit issued by cabinet – Jurisdiction of Department for Natural Resources.

- (1) Notwithstanding any other provision of law, no person and no city, county, or other political subdivision of the state, including levee districts, drainage districts, flood control districts or systems, or similar bodies, shall commence the construction, reconstruction, relocation or improvement of any dam, embankment, levee, dike, bridge, fill or other obstruction (except those constructed by the Department of Highways) across or along any stream, or in the floodway of any stream, unless the plans and specifications for such work have been submitted by the person or political subdivision responsible for the construction, reconstruction or improvement and such plans and specifications have been approved in writing by the cabinet and a permit issued. However, the cabinet by regulation may exempt those dams, embankments or other obstructions which are not of such size or type as to require approval by the cabinet in the interest of safety or retention of water supply.
- (2) No person, city, county or other political subdivision of the state shall commence the filling of any area with earth, debris, or any other material, or raise the level of any area in any manner, or place a building, barrier or obstruction of any sort on any area located adjacent to a river or stream or in the floodway of the stream so that such filling, raising or obstruction will in any way affect the flow of water in the channel or in the floodway of the stream unless plans and specifications for such work have been submitted to and approved by the cabinet and a permit issued as required in subsection (1) above.
- (3) Nothing in this section is intended to give the cabinet any jurisdiction or control over the construction, reconstruction, improvement, enlargement, maintenance or operation of any drainage district, ditch, or system established for agricultural purposes, or to require approval of the same except where such obstruction of the stream or floodway is determined by the cabinet to be a detriment or hindrance to the beneficial use of water resources in the area, and the person or political subdivision in control thereof so notified. The Department for Natural Resources through KRS Chapter 350 shall have exclusive jurisdiction over KRS Chapter 151 concerning the regulation of dams, levees, embankments, dikes, bridges, fills, or other obstructions across or along any stream or in the floodway of any stream which structures are permitted under KRS Chapter 350 for surface coal mining operations.

Effective: April 2, 1982

History: Amended 1982 Ky. Acts ch. 368, sec. 2, effective April 2, 1982. -- Created 1966 Ky. Acts ch. 23, sec. 29.

Legislative Research Commission Note (6/20/2005). 2005 Ky. Acts chs. 11, 85, 95, 97, 98, 99, 123, and 181 instruct the Reviser of Statutes to correct statutory references to agencies and officers whose names have been changed in 2005 legislation confirming the reorganization of the executive branch. Such a correction has been made in this section.

Milton Madison Bridge

Narrative on Construction and Demolition Activities

This narrative presumes that methods successfully used in previous bridge construction projects will be utilized. The means and methods will be determined by the contractor and monitored by the Owner's Representative for relative impacts. Any increase in impacts from those indicated in this permit application will be forwarded to the appropriate agencies for review.

Scour Protection: The river piers will require scour protection in the form of riprap, which will be installed from barges using clean rock. Prior to the installation of the riprap the affected area will be dredged to a depth sufficient to allow the scour countermeasure (jet grouting) to be installed below the existing mud line and contraction scour depth. The soil may be strengthened by installing jet grouting below the scour mitigation riprap elevation down to the existing bedrock.

River Pier Construction: The existing stem of the bridge piers at the waterline will need to be strengthened by increasing its size. This will increase the volume of fill below OHW, but the enlarged sections will not extend to the river bottom.

Bridge Demolition: Removal of the existing bridge deck will be done from the bridge itself with protective means utilized to prevent debris from falling into the river. The existing steel truss will be wired with explosives, blasted and dropped into the river. The navigable channel (existing Spans 6, 7, and 8) will be cleared within 48 hours. Steel will be removed by equipment working from barges. Steel dropped on land may be removed via conventional methods. All demolition will be governed by the contractor's demolition plan, which will be reviewed for approval by the Owner's Representative.

Demolition of Existing Pier 5 is anticipated to be performed from the work platform. Pier 5 will be removed down to the approximate mud line. No debris will be left in the river.

Superstructure Erection and Construction: Truss erection will be by cranes or lifting equipment operating from barges and will be governed by the contractor's erection plan, which will be reviewed for approval by the Owner's Representative. It is anticipated that more than one erection crew will be working in the river concurrently. Temporary falsework towers will likely be erected in the river close to the piers yet outside of the reduced temporary navigation channel. Coordination and adherences to the approved Maintenance and Protection of River Traffic Plan will be enforced. Working in the river will continue until the decking procedure progresses to placement stage.

Cleanup / Removal: Once construction has progressed sufficiently that river access for construction/demolition is deemed complete, the contractor shall remove any temporary supports, shoring, rock fills, or other appurtenances, in accordance with the approved demolition plan, and complete the rock scour protection. All erosion and sedimentation controls will be in place during the removal as defined in the demolition plan.

Tree Impacts and Planting Plan: Three trees greater than 10-inch diameter at breast height (dbh) are located in the park adjacent to the west side of the bridge. These trees may be removed to construct the bridge. Fifteen replacement trees at least 3 inches in diameter will be planted as mitigation. Other trees greater than 10-inch dbh will be avoided, and no tree clearing will be performed from April 1 through September 30 on trees suitable for Indiana bat roosting (greater than 3 inches).

Erosion Control Measures: Erosion control measures will be in accordance with Chapter 37 of the Indiana Design Manual and IDNR's "Indiana Handbook for Erosion Control in Developing Areas", all environmental permit requirements, and applicable Special Provisions. For this design build project the contractor should generate an Erosion & Sediment Control Plans and send to the INDOT Office of Environmental Services (OES) to review. Contractor will pay the fee for IDEM review. Contractor will contact OES for guidance on completing the Notice of Intent (NOI).

Hydraulic Data: See attached Hydraulic Report.

Temporary Impacts Associated With Construction:

Temporary Causeway Construction: To provide access for bridge construction equipment from the banks and to the river, an access road will be constructed of clean rock fill material down to the shoreline. Rock fill will be placed between the shoreline and temporary sheet piling to create work platforms, also described as "partial causeways." This causeway construction will follow the approved Erosion and Sedimentation Control Plan. All of the causeway fill material will be removed following construction.

Temporary Cofferdams: Temporary cofferdams will be needed to complete the pier strengthening on Piers 3, 4, and 5 (existing Piers 6, 7, and 8), as well as to demolish existing Pier 5. The perimeter formed by the cofferdams will extend around the existing piers and will be entirely within the footprint of the proposed scour mitigation. Cofferdams will be removed prior to installation of the scour mitigation.

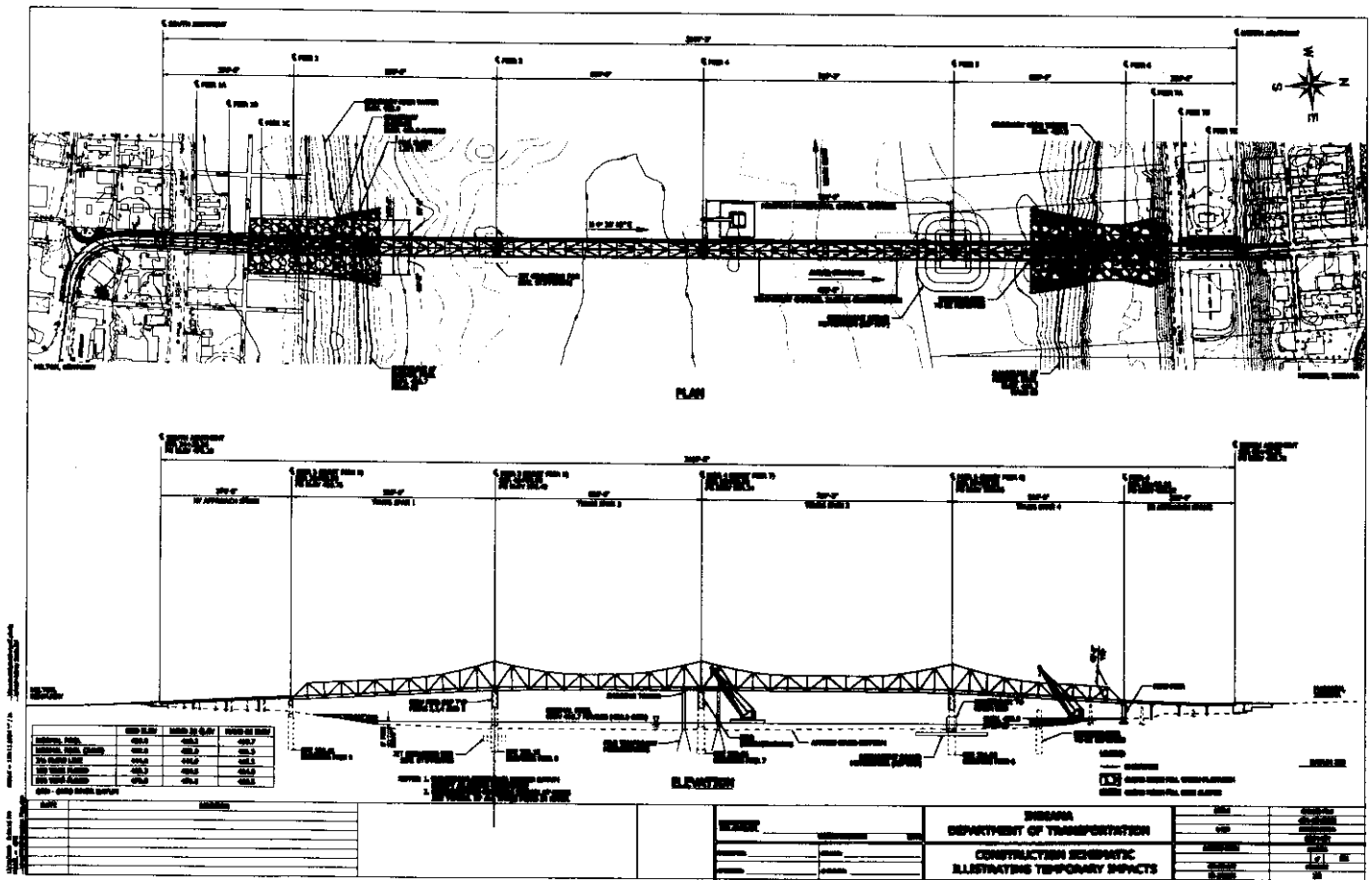
Temporary Retention for Dredging and Dewatering Operations: Dredging operations and dewatering of cofferdams shall have return waters pass through a temporary sediment basin or floating barge retention system before discharging into the Ohio River. Temporary sediment basin may be constructed within permanent Right-of-Way along the river banks in accordance with 205.03 with details in general conformance with INDOT Design Manual Fig. 37-3H. The Design Builder shall coordinate with the United States Coast Guard and the United States Army Corps of Engineers for use of floating barge retention systems. The Design/Builder shall prepare computations for sizing of the sediment basin and/or floating barge retention system and outfall structures. INDOT shall approve the location and details of temporary sediment basin and floating barge retention system prior to construction. Dredged material will be placed in an upland location.

Temporary Ferry Service/Ferry Landings: To maintain traffic service between Milton and Madison during the Milton-Madison Bridge closure (approximately 12 months), ferry service will be provided

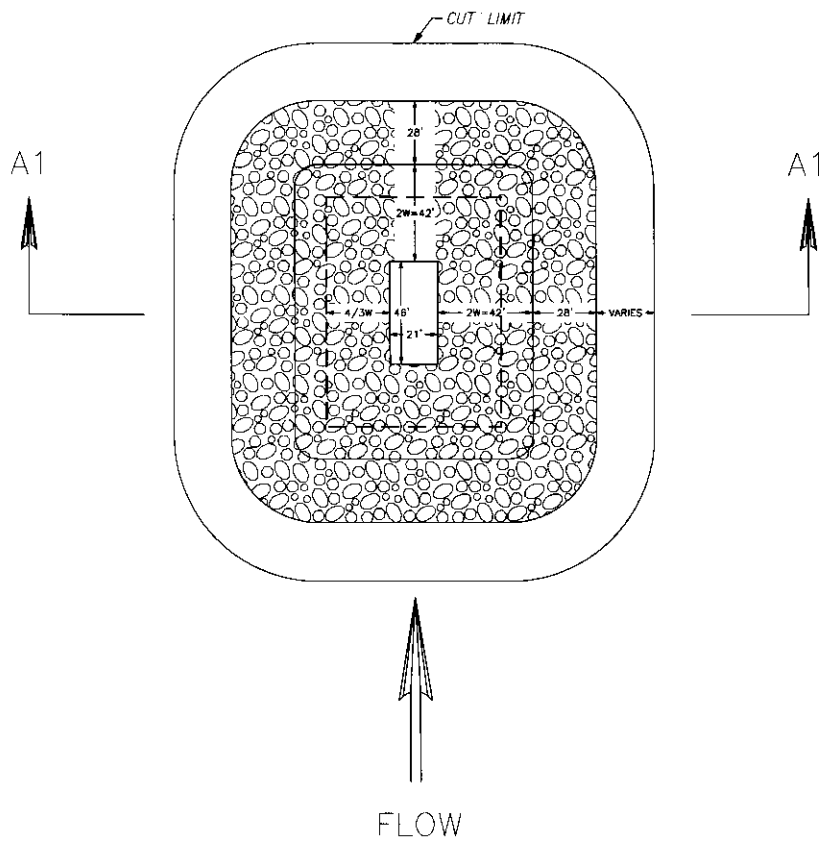
between the Milton boat launching ramp located at Ferry Street in Milton and a former boat launching ramp located at Ferry Street near the City of Madison campground. Both of these boat launching ramps are located upstream and east of the existing bridge.

The existing riverbed will be dredged to accommodate the proposed ferry service. The Milton Boat Ramp area and the Madison City Campground and undeveloped field to the south of the campground will be improved to handle the anticipated traffic volumes and facilitate safe ferry operation. The ferry areas will provide paved queuing space for at least 120 vehicles, additional paved parking spaces for at least 50 vehicles, and a loading area for cars and pedestrians boarding the ferry. Pavement for the ferry staging, parking and ramp areas will be determined by the Design/Builder. After traffic on the bridge resumes and ferry service is terminated, this pavement will be removed and the areas will be re-seeded and restored to the original condition or better.

Temporary Construction Staging: In Madison, the contractor may use the areas of Jaycee Park nearest the existing bridge for construction staging. The areas immediately adjacent to the existing bridge on the Milton side can be used for construction staging through a temporary easement.



US 421, Milton-Madison Bridge Replacement

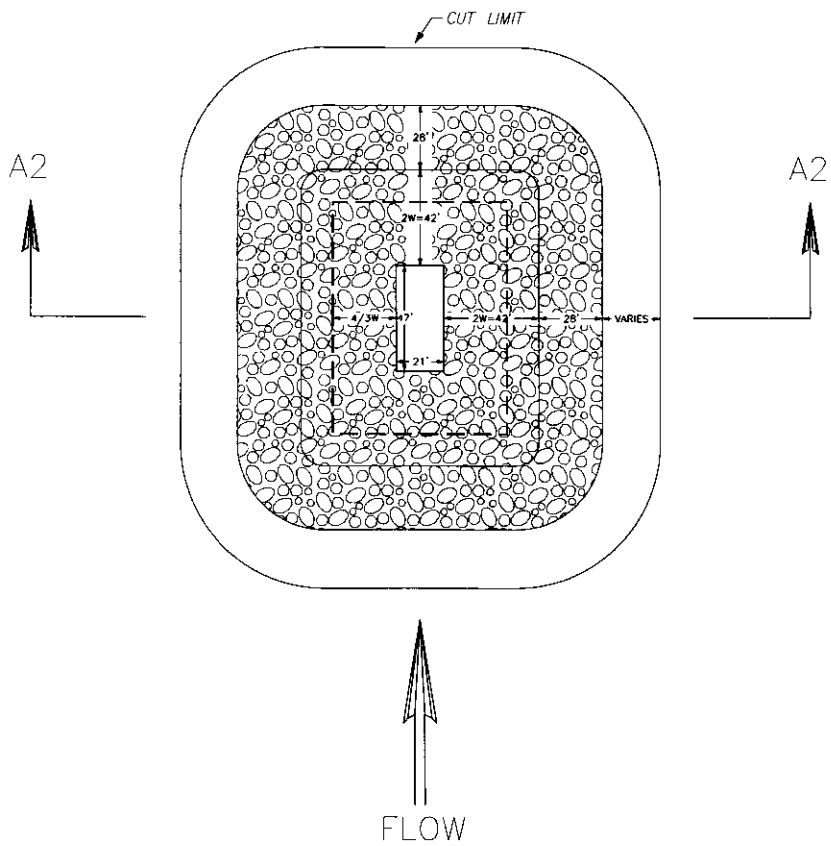


--- GEOCOMPOSITE BLANKET LIMIT

**MILTON MADISON BRIDGE
SCOUR COUNTERMEASURES**

**PIER 3 (EXIST PIER 8)
PLAN VIEW**

SCALE
0 25 50 FEET

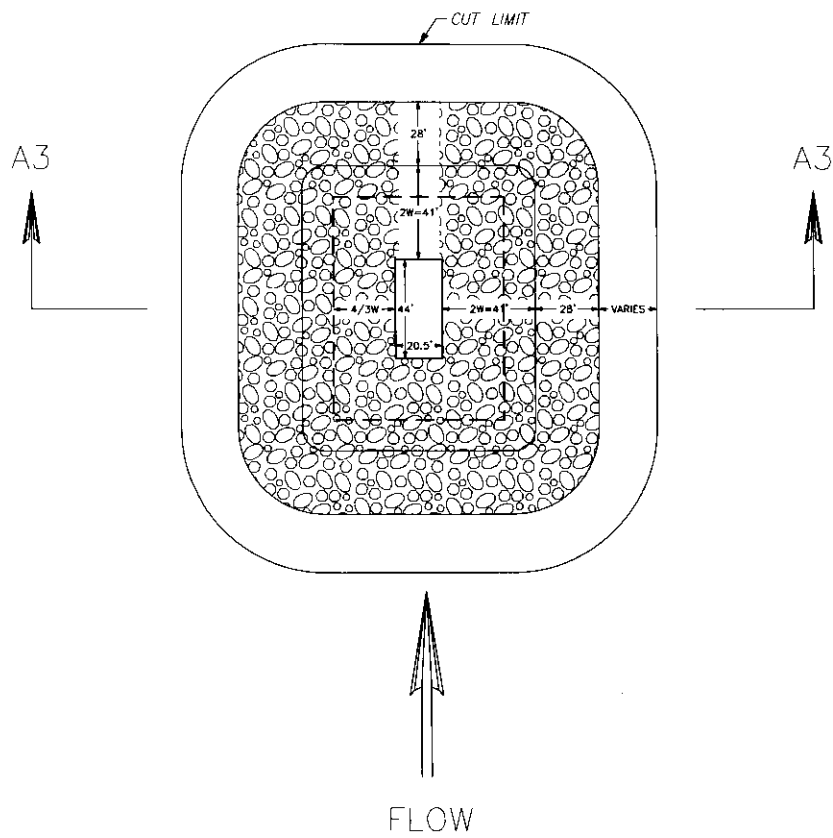


--- GEOCOMPOSITE BLANKET LIMIT

**MILTON MADISON BRIDGE
SCOUR COUNTERMEASURES**

**PIER 4 (EXIST PIER 7)
PLAN VIEW**

SCALE
0 25 50 FEET



--- GEOCOMPOSITE BLANKET LIMIT

**MILTON MADISON BRIDGE
SCOUR COUNTERMEASURES**

**PIER 5 (EXIST PIER 6)
PLAN VIEW**

SCALE
0 25 50 FEET

Environmental Assessment and Draft Section 4(f) Evaluation

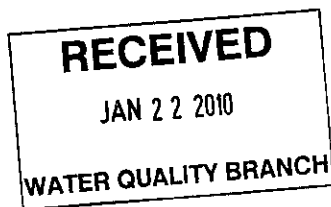
**Replacement of the US 421 Bridge Across the Ohio River
Between the Cities of Milton, Trimble County Kentucky and Madison, Jefferson County, Indiana
KYTC Item No. 5-135.8**

Submitted Pursuant to 42 USC 4332(2)(c) and 49 USC 303
by the

US Department of Transportation
Federal Highway Department (FHWA)
and
Kentucky Transportation Cabinet (KYTC)
and
Indiana Department of Transportation (INDOT)

Cooperating Agencies:
National Park Service
US Coast Guard
US Army Corps of Engineers

Submitted December 2009



The Environmental Assessment (EA) for the project is available on the project website at www.MiltonMadisonBridge.com. Paper copies of the reports referenced are available at the Milton Municipal Building (10179 Highway 421 North in Milton) and at the Mayor's Office in Madison (101 West Main Street in Madison).

Comments on the EA are requested by January 30, 2010 and may be address to the individuals listed above.

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Environmental Assessment and Draft Section 4(f) Evaluation

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US Army Corps of Engineers

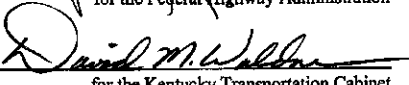
12/23/09

Date of Approval


for the Federal Highway Administration


12-22-09

Date of Approval


for the Kentucky Transportation Cabinet

12-22-09

Date of Approval


for the Indiana Department of Transportation

The following may be contacted for additional information concerning this document:

Mr. Jose Sepulveda
Division Administrator
Federal Highway Administration
330 West Broadway
Frankfort, KY 40601
(502) 223-6720

Mr. David M. Waldner, PE, Director
Division of Environmental Analysis
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622
(502) 564-7250

Mr. Ben Lawrence, PE
Office of Environmental Services
Indiana Department of Transportation
100 North Senate Avenue, N642
Indianapolis, IN 46204
(317) 233-1164

The Environmental Assessment (EA) for the project is available on the project website at www.MiltonMadisonBridge.com. Paper copies of the reports referenced are available at the Milton Municipal Building (10179 Highway 421 North in Milton) and at the Mayor's Office in Madison (101 West Main Street in Madison).

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The communities connected by the bridge are marked by their rich history and interdependence.

Madison, Indiana was established in 1809 and is located in Jefferson County, Indiana. Madison has been designated as a National Historic Landmark and contains more than 1,800 historic resources. Its historic district signifies Midwestern Frontier life during much of the nineteenth century and early twentieth century, through the Great Depression. Today, the population of Madison is 12,600 while Jefferson County has a population of approximately 33,000 residents. The community is divided into historic Lower Madison and more modern Upper Madison located atop the Ohio River hills.

Milton, Kentucky was established in 1789 and is located in Trimble County, Kentucky. Historically, Milton was an industrial and economic center comparable to Madison across the Ohio River. Numerous floods throughout the twentieth century stifled Milton's growth and development was redirected to the top of the surrounding ridges, above the floodplain. Today, Milton is primarily an agricultural community that is divided into Lower Milton, nearest the Ohio River, and Upper Milton, atop the ridgeline along US 421. The remaining businesses in Lower Milton are clustered around the US 421 Bridge. The population of Milton is 597 while Trimble County's population is approximately 9,000.

Regionally, the communities are served by US 421 (north-south), Indiana SR 56 (east-west), Indiana SR 62 (east-west), and Kentucky Route 36 (east-west). US 421 serves local transportation needs by providing an Ohio River crossing between Milton and Madison. US 421 also provides a connection to the regional transportation network by reaching surrounding communities in both Kentucky and Indiana and by stretching between Interstate 71 to the south and Interstate 74 to the north. The US 421 Bridge over the Ohio River serves a vital role for residents within the communities by providing access to health services, employment, retail, and services; allowing the transfer of goods; and supporting tourism in the region.

1.2 Project History and Documentation

In the mid-1990s, KYTC and INDOT undertook a planning study and environmental overview to replace the existing bridge. This study identified a number of potential river crossing location alternatives and assembled information on the environmental constraints existing at that time. However, no final alternative was selected for implementation since the existing structure was rehabilitated in 1997 to extend the life 10-20 years.

Since that time, numerous changes in the project area have occurred which could affect the alternatives development and evaluation processes. Significantly, a large portion of downtown Madison has been designated as a National Historic Landmark District since the 1995 report was published. The current Milton-Madison Bridge Project used this previous report as a baseline for assembling environmental data and developing alternatives.

As part of the current project, a number of reports have been published that document the conditions in the study area and describe the alternatives development process. These reports are available on the Milton-Madison Bridge Project website at www.MiltonMadisonBridge.com. Paper copies of the reports referenced are available at the Milton Municipal Building (10179 Highway 421 North in Milton) and at the Mayor's Office in Madison (101 West Main Street in Madison).

- The *Needs and Deficiencies Report* documents the existing conditions in the study area.

- The *Purpose and Need Statement* establishes what the project should accomplish. It was developed collaboratively through a rigorous process to get a broad range of input from Section 6002 Agencies¹, Project Advisory Group (PAG) members², and the public.
- The *Environmental Overview Report* outlines readily accessible data gathered from agency databases and windshield surveys, used to help screen the initial alternatives. This level of analysis is intended to cover a large study area and identify any “red flags” that would make an alternative unreasonable.
- The *Initial Location Alternatives Screening Report* contains a description of the bridge location alternatives considered and the results of the first level of evaluation, the screening against Purpose and Need and Secondary Factors, recommending four new bridge alternatives and the Do Nothing alternative for additional study.
- The *Alternatives Selection Report* describes the potential impacts that could result from the four new bridge alternatives recommended for additional study and explains the decision-making process that led to the selection of a Preferred Alternative.

1.3 Proposed Action

The proposed project recommends replacing the existing truss superstructure with a new, wider superstructure similar in appearance to the existing one. The roadway would be widened to 40 feet, which includes two 12-foot lanes and 8-foot shoulders with a bike lane in each shoulder. A 5-foot wide sidewalk would be cantilevered to the downstream side of the truss. The existing piers would be modified and strengthened to support the new wider superstructure. In the Proposed Action, minor widening within the existing rights-of-way would occur to the roadways approaching the bridge to transition from the widened bridge width back to the existing approach lane width. The footprint for this alternative in Indiana and Kentucky is entirely contained within the existing right-of-way.

The Proposed Action could be constructed by February 2012. It would require that the bridge be closed for up to 12 months during construction. To preserve community connectivity, a ferry between Milton and Madison would be provided during the closure period. The Markland Dam Bridge would be the nearest river crossing which could be used to provide a detour route during the closure of the bridge.

¹ Section 6002 of SAFETEA-LU establishes an environmental review process for transportation projects. These requirements are intended to streamline early coordination efforts between federal agencies and other federal, state, local, and tribal government agencies during the project development process.

² The Project Advisory Group (PAG) is a group of local stakeholders, nominated by local elected officials, who were selected to represent a cross-section of the two communities. Members were selected with backgrounds in historic preservation, economic development, healthcare, education, and other interests to capture a fair balance of perspectives which mirror those of the larger communities.



Chapter 2

Purpose and Need

The Purpose and Need Statement for the Milton-Madison Bridge Project was developed through a rigorous process to get a broad range of input from Section 6002 Agencies, Section 106 Consulting Parties¹, Project Advisory Group (PAG) members, and the public. At the November 2008 PAG meeting, PAG representatives and other members of the public in attendance were asked to describe how they use the existing US 421 Bridge, why it is important to the community, and any concerns they have with the existing structure. Additionally, requests for agency feedback were sent to Participating and Cooperating Agencies. Input from these groups has been incorporated into the Purpose and Need document.

2.1 Project Need: What is the Problem?

The Project Need describes the transportation deficiency. It is the foundation of the entire decision-making process. The Need provides data and facts to support the Purpose and explains why the project is needed.

The Need for the Milton-Madison Bridge replacement/rehabilitation is based on the following factors:

- Bridge Deficiencies
 - Functionally Obsolete (geometry doesn't meet current standards)
 - Structurally Deficient/Service Life (member age and condition)
- Safety on the Bridge

The facts that support the functional/structural deficiencies and safety issues are discussed in more detail in the following sections.

¹ Any organization or individual with a demonstrated interest in historic preservation who participated in the Section 106 consultation process, as defined in 36 CFR 800(c).

approximately 70% of the trips crossing the US 421 Bridge over the Ohio River have origins or destinations within Madison.

2.3.4 Community Connectivity

Despite the barrier caused by the Ohio River, Madison and Milton function as one larger community socially and economically. Many people in the area live in one state and work or shop in the other. Also, family lines and social interactions routinely cross the river between the two communities. Currently one of the largest man-made features in either city, the US 421 Bridge over the Ohio River is a unifying focal point and part of the regional character. The US 421 Bridge over the Ohio River preserves the practical ability for these two communities to interact on a day-to-day basis. Both Milton and Madison have grown to depend on the US 421 Bridge over the Ohio River being in service to provide a link between the two cities.

2.3.5 Safety

The existing US 421 Bridge over the Ohio River demonstrates vehicle crash frequencies at 1.3 times the statewide rate, based on Kentucky crash data and methodologies. During 2004 to 2007, there were 48 reported crashes on the bridge between First Street in Madison and milepoint 18.7 (east of Cooper's Bottom Road intersection) in Kentucky. Of these crashes, 12 resulted in injuries. Approximately half of the total crashes were rear end collisions.

Lane widths and stopping sight distances on the existing bridge are safety concerns. The current US 421 Bridge over the Ohio River consists of two lanes, each 10 feet wide. There are crest and sag locations on the US 421 Bridge over the Ohio River that have substandard sight distances on vertical curves. The current driveway configurations to access commercial properties adjacent to the approaches creates safety concerns. These elements contribute to the crash trends discussed in the previous paragraph.

In considering another aspect of safety, the US 421 Bridge over the Ohio River serves as a critical link between the hospital in Madison and the population of Trimble County. A reliable, safe, efficient cross-river movement is essential in emergency response situations.



Chapter 3

Alternatives Considered

The development of bridge location alternatives began with a broad examination of potential solutions to the identified transportation need. Concepts for initial consideration included the following:

- No Build Alternative
- Travel Demand Management (TDM) Alternative
- Transportation System Management (TSM) Alternative
- Transit Alternative
- Ferry Alternative
- Tunnel Alternative
- Bridge Rehabilitation Alternative
- Superstructure Replacement Alternative
- New Bridge on New Alignment Alternative

The TDM, TSM, transit, ferry, and tunnel strategies were dismissed because they did not satisfy the project purpose or would be cost prohibitive based on preliminary estimates. A short description of these alternatives appears in **Appendix A**.

Four strategies were identified to be carried forward in the NEPA process. Alternatives were suggested by representatives of a citizen Project Advisory Group (PAG), Section 106 consulting parties, local officials, and members of the public. Once the proposed alternatives were determined, potential river-crossing locations were screened to identify concepts that should be studied in more detail.

Based on current traffic volumes and projected growth rates, a two lane river crossing was determined to be capable of meeting the traffic demand through the 2030 design year and beyond. Therefore, a two lane cross-section was assumed for all build alternatives. Existing traffic volumes and future projections are discussed in Chapter 4 of the *Needs and Deficiencies Report*, available on the project website.

3.1 Range of Alternatives Identified

Four strategies were identified that could potentially meet the project purpose: No Build, Rehabilitation, Superstructure Replacement, and New Bridge at a New Location. The following sections describe these alternatives.

3.1.1 No Build

The No Build Alternative (Alternative 1) serves as a baseline for comparison between other alternatives. It includes minor routine maintenance on the bridge, such as frequent inspections and replacement of isolated members as the condition necessitates it. As a result of the 2008 inspection, the bridge is currently posted with a 15 ton weight limit. As the bridge continues to age, its condition would further deteriorate and it would be necessary first to permanently limit the weight of vehicles crossing and eventually to close the bridge to all traffic (estimated to occur by 2020-2025).

An in-depth inspection of the existing bridge was completed in August 2009; findings indicate that the truss members are generally in poor condition. The inspection identified a number of immediate priority repairs to maintain or restore structural integrity. It also identified several near term (6-12 months), and long term (within 2 years) repairs that should be made. The condition of the existing bridge is documented in the *Needs and Deficiencies Report*, available on the project website.

3.1.2 Rehabilitation

The Rehabilitation Alternative (Alternative 2) would extend the service life of the bridge while preserving its historically significant elements. In this alternative, the existing structure would be cleaned and repainted, key members would be repaired as needed, and the deck would be replaced. This alternative addresses structural deficiencies but does not address the safety concerns associated with the narrow width. Although this alternative would extend the service life of the bridge by an estimated 20 to 25 years, continuing steel deterioration would likely require that the bridge be closed to all traffic by 2045 based on previously published bridge inspection reports.

3.1.3 Superstructure Replacement

The Superstructure Replacement Alternative (Alternative 3) would build a new bridge using the existing piers. In this alternative, the existing truss superstructure would be removed, piers reinforced and widened to support a wider cross-section for traffic, and a new superstructure constructed atop the existing piers. A ferry service would maintain traffic between the two communities to preserve the cross-river connection during construction when the bridge is closed to traffic.

3.1.4 New Bridge at a New Location

Thirteen potential new crossing locations were suggested (shown in **Figure 3.1**) and are discussed briefly below. Additional information about the new location alternatives considered is presented in the *Initial Location Alternatives Screening Report*, available on the project website.

Building on a new alignment would allow the existing structure to continue moving traffic (vehicles less than 15 tons) across the river until the new bridge can be opened. However, KYTC/INDOT made a decision not to maintain more than one river crossing at this location.

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Therefore, following construction of a new river crossing, the old bridge would either be removed or its ownership would be transferred to another group that would assume associated maintenance responsibilities and costs, along with all liabilities for the structure. Any new river crossing location was assumed to provide adequate shoulder widths and a sidewalk connection between communities. From west to east, the new alignment alternatives include:

The Bypass Alternative (Alternative 4) would construct a new bridge west of Madison, lining up with SR 62 as a western bypass of the communities. Due to the terrain at this location, the bridge would span from hilltop to hilltop and the approach in Kentucky would require almost four miles of additional infrastructure to tie into US 421.

The Clifty Park Alternative (Alternative 15) would construct a new bridge connecting to SR 56 near the eastern boundary of Clifty Falls State Park in Madison. It would travel south across the river and up the ridge in Kentucky to connect to US 421 near the Riverview Drive intersection.

The Jefferson Street Alternatives would extend from Jefferson Street in Madison directly south into Kentucky. In Kentucky, Jefferson Street Alternative A (Alternative 5) would curve to the east on a section of viaduct and connect to KY 36 near Ferry Street in Milton. Jefferson Street Alternative B (Alternative 6) would connect directly into Coopers Bottom Road in Kentucky, requiring the elevation of this road to be raised 30-40 feet.

The Parallel Alternative (Alternative 7) would construct a new structure immediately east of the existing US 421 bridge. The approach would connect to US 421 at the base of Milton Hill¹.

The KY 36 Alternative (Alternative 8) would extend north from Ferry Street in Milton, passing above a western extension of KY 36. It would cross the river and connect directly into SR 56 in Indiana, approximately 400 feet east of the existing structure.

The Around Milton Alternative (Alternative 9) would extend northeast from the base of Milton Hill to pass over KY 36 between Milton's Ferry Street and School Hollow Road. It would cross the Ohio River at an angle and tie directly into SR 56 in Indiana near the eastern end of First Street.

The Madison Ferry Street Alternative (Alternative 10) would extend south from Ferry Street in Madison. From the north, it would cross the river, overpass KY 36 at the intersection with School Hollow Road, and connect into US 421 at the base of Milton Hill.

The Canip Creek Alternatives would construct a new bridge near Canip Creek, east of Milton. Canip Creek Alternative A (Alternative 11) would follow Spring Street from the base of Milton Hill through the city park, travel northwest across the Ohio River, and connect to SR 56 near the eastern end of First Street in Madison. Canip Creek Alternative B (Alternative 12) would tie into KY 36 with a flyover ramp east of Canip Creek then travel north to connect directly to SR 56 in a T-intersection.

The End of Fulton Alternative (Alternative 16) would construct a new bridge with a flyover ramp to SR 56 near the intersection of Fulton Drive east of Madison. In Kentucky, it would connect to KY 36 near Riverdale Drive with a second flyover ramp.

¹ Milton Hill is the local name for US 421 as it travels down the ridge parallel to the Ohio River, separating Upper Milton and Lower Milton while dropping over 300 feet in elevation.

The Lonesome Hollow Alternative (Alternative 13) would construct a structure approximately a mile east of the existing bridge with a flyover ramp connection to SR 56. The hollow would allow this alternative to make use of the natural topography for a future connection to the hilltop in Indiana. In Kentucky, the bridge would connect to KY 36 with a flyover ramp near the historic Richwood Plantation.

The Eagle Hollow Alternative (Alternative 14) would construct a new structure approximately 1.9 miles east of the existing bridge with a flyover ramp connection to SR 56. The hollow would allow this alternative to make use of the natural topography for a future connection to the hilltop in Indiana. In Kentucky, the bridge would connect to KY 36 with a second flyover ramp west of Canip Creek Road.

3.2 Screening of Alternatives

The sixteen alternatives described above were evaluated in a first level of screening to identify a smaller subset of reasonable alternatives. The entire range of alternatives identified was first screened against Purpose and Need performance measures to identify the reasonable range of alternatives. Then, the reasonable range of alternatives that satisfied the project purpose was screened against Secondary Considerations criteria to identify a subset of the best alternatives for detailed study. Both of these screening steps are described in the *Initial Location Alternatives Screening Report*, available on the project website.

3.2.1 Screening against Purpose and Need

The project Purpose and Need Statement describes what the project should accomplish. It forms the basis for the decision-making process: each alternative must meet the purpose and address each of the identified needs to be considered a viable solution. Of the sixteen alternatives initially defined, five alternatives were eliminated from further consideration because they do not satisfy the performance measures to fully address the Purpose and Need for the project. Performance measures were developed alongside the Purpose and Need Statement, reviewed by PAG members, Section 6002 agencies, and the public. Although the No Build Alternative does not satisfy the Purpose and Need, it has been carried forward for future consideration to serve as a baseline for comparison among other alternatives.

Purpose and Need Performance Measures

Improve or Replace Bridge

- Address functional obsolescence (lane widths)
- Address structural deficiencies – one structure maintained by KYTC and INDOT

Mobility/Connectivity

- Maintains or decreases travel times, costs, or distances from US 421-KY 36 to US 421-SR 56 (Main Street at Jefferson Street)
- Maintains linkage between Lower Milton and Lower Madison
- Anticipated lifespan of improvement
- Maintains or reduces number of turns required on approach roadways to connect to the regional road network
- Maintains or reduces number of substandard turning radii at approach intersections

Safety

- Meets design requirements for stopping sight distance on bridge and approaches
- Meets design requirements for horizontal alignment on bridge and approaches
- Maintains or improves intersections on approach roadways to allow truck turning movements
- Improves control of access points

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The Rehabilitation Alternative (Alternative 2) would not address the existing geometric deficiencies of the US 421 bridge: it would not widen the travel lanes or provide adequate shoulder widths (functional obsolescence). The lifespan of this alternative would be less than other build alternatives. It would not meet current design standards for stopping sight distance or horizontal alignment on the bridge (safety). Therefore, it would not meet the first or third project purposes.

The Bypass Alternative (Alternative 4) would significantly increase travel times and distances between the KY 36-US 421 intersection and the SR 56-US 421-Jefferson Street intersection, would not maintain a community linkage, and would increase the number of turns along US 421 (mobility/connectivity). Therefore, it would not meet the second project purpose.

The Clifty Park Alternative (Alternative 15) would significantly increase travel times and distances between the KY 36-US 421 intersection and the SR 56-US 421-Jefferson Street intersection, would not maintain a community linkage, and would increase the number of turns along US 421 (mobility/connectivity). Therefore, it would not meet the second project purpose.

The Lonesome Hollow Alternative (Alternative 13) would increase travel times and distances between the KY 36-US 421 intersection and the SR 56-US 421-Jefferson Street intersection (mobility/connectivity). Therefore, it would not meet the second project purpose.

The Eagle Hollow Alternative (Alternative 14) would increase travel times and distances between the KY 36-US 421 intersection and the SR 56-US 421-Jefferson Street intersection and would not maintain a community linkage (mobility/connectivity). Therefore, it would not meet the second project purpose.

3.2.2 Screening against Other Considerations

The eleven alternatives that satisfy the Purpose and Need passed through a second screening component: evaluation against secondary considerations. These factors describe other values, issues, and concerns beyond the primary transportation needs that were considered. These considerations were developed alongside the Purpose and Need Statement, with input from agencies, Section 106 consulting parties, and the public.

Secondary Considerations included:

- | | |
|---|--|
| - Minimizing costs to build/maintain bridge | - Providing safe cross-river mobility for pedestrians and bicyclists |
| - Maintaining/enhancing quality of life | - Maintaining/improving safety on connecting roadways |
| - Being sensitive to local resources | - Providing for river navigation |
| - Considering future hilltop connections | |
| - Improving system reliability | |
| - Improving traffic flow on connecting roadways | |

During the decision-making process, these factors were balanced against one another to help define the best overall solution. Of the eleven alternatives evaluated, the following five alternatives were eliminated from further consideration based on their secondary impacts.

The Jefferson Street Alternatives (Alternatives 5-6) would have the largest footprint within the National Historic Landmark District and would have substantial impacts on resources in the heart of this landmark. This district was designated in order to protect "nationally significant historic places ... [that] possess exceptional value or quality in illustrating or interpreting the

heritage of the United States.”² Other bridge location alternatives exist that have fewer impacts on this resource. The connection in Kentucky back to US 421 would increase costs, affect historic resources, and require the displacement of between 5 to 20 homes and businesses in Milton, depending on the approach configuration. The Kentucky bridge approach would remain in the 100-year floodplain. Other alternatives exist which would provide a more direct, less costly approach in Kentucky with fewer impacts.

The Parallel Alternative (Alternative 7) would displace a large portion of downtown Milton. It would infringe on three of the four historic districts in the area: the National Historic Landmark District in Madison, the Madison National Register District, and the Third Street National Register District in Milton. The connection to US 421 south of the bridge would be complicated by topography; it would be difficult to provide a safe, cost-effective connection from Milton Hill to the bridge that does not force through traffic to stop. PAG members and local government officials strongly favor a continuous movement along US 421 in Kentucky. The Kentucky bridge approach would remain in the 100-year floodplain. Other alternatives exist that have fewer impacts on historic resources and on the community of Milton.

The KY 36 Alternative (Alternative 8) would displace the majority of development along the main street in Lower Milton. The US 421 southern approach would result in 5 to 10 residential and business displacements in Lower Milton. Routing KY 36 traffic through downtown Milton to access the bridge would lead to additional residential displacements. This alternative would infringe on the National Landmark and the Madison National Register District. Both approaches for this alignment could be constructed out of the 100-year floodplain. This alternative received support from local government officials in Trimble County because it would provide a continuous movement along US 421 in Kentucky and allow the existing bridge to carry traffic during construction. However, other alternatives also satisfy these objectives (e.g. Alternatives 9 and 12) with fewer relocations in Milton and without entering the Madison National Historic Landmark District.

The End of Fulton Alternative (Alternative 16) would reduce the number of required displacements in Madison, but would have sizeable costs and environmental impacts. The topography of the Indiana riverbank is too steep for the proposed bridge over the river to be able to meet the vertical clearance over the navigation channel required by the Coast Guard and still connect to SR 56 at ground level. Therefore, the bridge would have to cross over SR 56 with a flyover ramp. This would increase the length (and cost) of the bridge over the river. It would require an extremely large rock cut immediately north of SR 56 that would create a scar along the ridgeline. Visual and natural environmental impacts would result from this cut into the hillside; construction impacts from blasting into the ridge would also affect area residents. Both KY 36 and SR 56 at the tie down locations are within the 100-year floodplain. Other alternatives exist that would have fewer impacts on historic resources and on the human and natural environment.

The results of this level of screening are documented in the *Initial Location Alternatives Screening Report*, available on the project website. The alternatives eliminated from further consideration because of their secondary impacts would result in significantly greater impacts to historic resources (the National Historic Landmark or historic elements within Lower Milton) or the environment (community cohesiveness within Milton, natural elements along SR 56) than the remaining alternatives.

² Based on National Park Service definition, available online at www.nps.gov/history/nhl/

Based on the results of the Level 1 screening, four alternatives were carried forward for detailed development and additional evaluation: No Build, Superstructure Replacement, Tiber Creek (a hybrid of Alternatives 9 and 10), and Canip Creek (a hybrid of Alternatives 11 and 12). **Figure 3.2** shows the corridor footprints for these build alternatives.

Six variations of these alternatives – No Build, Superstructure Replacement with Full Approaches, Superstructure Replacement with Minimal Approaches, Tiber Creek A, Tiber Creek B, and Canip Creek were evaluated against key environmental factors. Detailed descriptions of the alternatives and results of the screening analysis are discussed in the *Alternatives Selection Report*, available on the project website.

3.2.3 Screening against Section 4(f)

The remaining six alternatives were screened against Section 4(f) resources. Section 4(f) of the Department of Transportation Action protects publicly owned parks, recreation areas, wildlife refuges, and historic sites. By law, a Section 4(f) property may be converted to a transportation use only if there is no prudent and feasible alternative and if the project includes all possible planning to minimize harm to the resource. Section 4(f) resources are discussed further in **Chapter 8** of this document.

Generally, use of a Section 4(f) resource occurs when land from a resource is acquired for conversion to a transportation use, there is an adverse temporary occupancy of a property, or proximity effects are great enough to substantially impair use of the property. Temporary impacts may occur during construction and might include impacts to air quality, noise, vibration, water quality, viewsheds, or transportation access. Temporary occupancy of a property is generally considered adverse unless

- the duration of occupancy is less than the construction period for the project;
- there is no change in ownership;
- the nature and magnitude of changes to the Section 4(f) resource are minimal;
- there are no anticipated permanent adverse physical changes;
- there is no interference with recreational activities (temporary or permanent);
- the land is restored to the original condition or better; and
- the agencies with jurisdiction agree to the conditions above.

Appendix B contains a description of the Section 4(f) resources near each of the alternatives that could potentially be impacted by the proposed transportation corridors or construction activities.

The No Build Alternative may ultimately result in the removal of the existing bridge when its condition deteriorates to an unsafe level. This would lead to a long term reduction in access for both communities. In the short term, the bridge would be subject to inspections, repairs, and routine maintenance. No Section 4(f) uses would result from this alternative.

The Superstructure Replacement with Full Approaches Alternative would result in Section 4(f) uses within the Madison National Historic Landmark District, the Madison Historic District, the Third Street Historic District in Milton, and for the US 421 Bridge itself. Uses of historic properties are documented in **Appendix C**. This alternative would result in the displacement of eight individually eligible or contributing historic structures, plus partial takes for eight additional parcels containing historic resources (in addition to the bridge). Each of these displacements and partial takes would constitute a Section 4(f) use. The Milton Boat Ramp is a public recreational resource protected by Section 4(f) and would be converted to a ferry landing in this alternative, temporarily unavailable for public recreational use. The Madison City Campground is a public recreational resource protected by Section 4(f) and would be used as a ferry queuing area in this alternative, temporarily unavailable for public recreational use. The Jaycee Park in Madison is a public recreational resource protected by Section 4(f); portions of Jaycee Park would likely be used as a construction staging area. **Chapter 8** contains a discussion of Section 4(f) findings for impacts to these resources.

The Superstructure Replacement with Minimal Approaches Alternative would result in a Section 4(f) use for the US 421 Bridge itself. Uses of historic properties are documented in **Appendix C**. As in the Superstructure Replacement with Full Approaches Alternative, the public boat ramp in Milton and Madison City Campground would be converted to ferry landings, temporarily unavailable for public recreational use. Portions of Jaycee Park would likely be used as a construction staging area. The campground would result in a net benefit Section 4(f) use; the park and boat ramp would result in a *de minimis* Section 4(f) use.

The Tiber Creek Alternative A would result in Section 4(f) uses within the Madison National Historic Landmark District and the Madison Historic District. If ownership of the bridge were not taken over by a third party, removal of the 1929 structure would result in a Section 4(f) use of this property. Uses of historic properties are documented in **Appendix C**. This alternative would result in the displacement of five individually eligible or contributing historic structures, plus partial takes for 20 additional parcels containing historic resources (in addition to the bridge). Each of these displacements and partial takes would constitute a Section 4(f) use. The proposed structure would pass above the publicly owned Madison City Campground and adjacent to the Milton City Park. In this alternative, the Madison City Campground would be displaced, unavailable for public recreational use. Although the structure would lie beyond the footprint of the Milton City Park, the proximity impacts would have the potential to impair use of the park as a recreational resource.

The Tiber Creek Alternative B would result in Section 4(f) uses within the Madison National Historic Landmark District and the Madison Historic District. If ownership of the bridge were not taken over by a third party, removal of the 1929 structure would result in a Section 4(f) use for this property. Uses of historic properties are documented in **Appendix C**. This alternative would result in the displacement of eight individually eligible or contributing historic structures, plus partial takes for 22 additional parcels containing historic resources (in addition to the bridge). Each of these displacements and partial takes would constitute a Section 4(f) use. The proposed structure would pass adjacent to the publicly owned Madison City Campground (potentially disturbing the eastern access point) and alongside the Milton City Park. Although the structure would be beyond the footprint of the Milton City Park in this alternative, the proximity impacts have the potential to impair use of the park as a recreational resource.

The Canip Creek Alternative would result in Section 4(f) uses within the Madison National Historic Landmark District, the Madison Historic District, and the Hunter's Bottom Historic District. If ownership of the bridge were not taken over by a third party, removal of the 1929 structure would result in a Section 4(f) use of this property. Uses of historic properties are documented in **Appendix C**. This alternative would result in the displacement of nine individually eligible or contributing historic structures, plus partial takes for 24 additional parcels containing historic resources (in addition to the bridge). Each of these displacements and partial takes would constitute a Section 4(f) use. The City Park in Milton is a public recreational facility protected by Section 4(f). The proposed structure would bisect the Milton City Park in this alternative. Right-of-way acquisition within the park area would be required, resulting in a Section 4(f) use; however, coordination with the city could potentially maintain the multi-use trail beneath the elevated structure.

Table 3.1 compares the impacts to Section 4(f) resources for each of these alternatives. As a result of this screening, four alternatives were eliminated from further study because of their impacts on Section 4(f) resources. The No Build and Superstructure Replacement with Minimal Approaches Alternatives are the remaining prudent and feasible alternatives which are discussed in the following chapters. A detailed description of the Superstructure Replacement with Minimal Approaches Alternative (i.e. the Proposed Action for the Project) is included in **Appendix D**.

Table 3.1 – Adverse Findings on Section 4(f) Resources

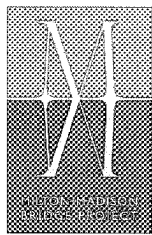
Permanent conversion of land to a transportation use	No Build ¹	Superstructure Full	Superstructure Minimal	Tiber A	Tiber B	Canip
National Historic Landmark	No	Yes	No	Yes	Yes	Yes
Madison Historic District	No	Yes	No	Yes	Yes	Yes
Third Street Historic District	No	Yes	No	No	No	No
Hunter's Bottom Historic District	No	No	No	No	No	Yes
US 421 Bridge	No	Yes	Yes	Potential ²	Potential ²	Potential ²
Number of other historic structures beyond districts directly affected	No	No	No	Yes (2)	Yes (3)	Yes (2)
Jaycee Park, Madison	No	Potential Temporary Use ³	Potential Temporary Use ³	No	No	No
Madison Campground	No	Temporary Use ⁴	Temporary Use ⁴	Yes	Yes	No
Milton Boat Ramp	No	Temporary Use ⁴	Temporary Use ⁴	No	No	No
Milton City Park	No	No	No	No	Yes	Yes

¹ No Build does not meet project purpose

² In the Tiber A, Tiber B, and Canip Alternatives, the existing bridge could be taken over by a third party. If no third party is identified to assume ownership responsibilities, the existing bridge will be demolished following construction of the new structure.

³ Potential use of resource for construction staging area, to be determined by contractor

⁴ Potential use of resource for ferry operation



Chapter 4

Environment & Impacts

This chapter describes key elements of the affected environment and impacts resulting from the two remaining alternatives: the No Build Alternative and the Proposed Action - the Superstructure Replacement with Minimal Approaches Alternative - presented in the previous chapter. The *Environmental Overview Report*, available on the project website, documents the existing environmental characteristics of the project area in greater detail.

Minor environmental impacts would result from the Proposed Action; these are primarily related to traffic disruption during construction. The following sections present information about impacts to traffic, socioeconomics, cultural resources, the visual environment, noise, air quality, ecological resources, hazardous materials, and river navigation.

4.1 Traffic Patterns

Impacts to traffic volumes and circulation patterns were compared for the Proposed Action and No Build Alternative against the existing conditions.

The majority of trips on the US 421 Bridge are local based on the findings of the 2008 traffic origin-destination study described in the *Needs and Deficiencies Report*, available on the project website. The US 421 Bridge serves as a key commuter link, connecting employment centers in Madison and Carrollton to the labor force in the opposite state. It provides the most direct link to emergency health care facilities and retail developments for Trimble County residents.

A survey of companies in the freight industry was conducted in the spring of 2009. Representative companies were chosen to characterize a balance of industry types, company sizes, and geographic distribution. The survey identified a number of key results that were used to develop assumptions about future traffic scenarios:

- Most national motor carriers use the Ohio River as a boundary between service districts; few if any national shipping trucks use the US 421 Bridge between Milton and Madison, preferring interstate routes for longer distance trips.
- Local shippers using the bridge (prior to the 15 ton weight limit) reportedly would face cost increases to complete the longer trip between communities via the Markland Dam if the US 421 Bridge were closed to truck traffic. While the detour to Markland would not affect customer prices in the short term, if the US 421 Bridge were closed to trucks for

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an extended period, customer prices would likely increase to compensate. Three of fourteen companies indicated an extended limitation on truck traffic crossing the US 421 Bridge would eliminate their cross-river service.

- While existing lane widths on the bridge are adequate for smaller vehicles, when heavy commercial traffic meets on the bridge in opposing lanes, traffic flow is dramatically reduced and speeds decrease to 20 or 25 miles per hour.
- Representatives of the shipping industry identified geometric issues that hinder safe and efficient traffic flow along US 421:
 - tight turns in Madison approaching Harrison Street
 - geometric deficiencies on SR 56 east of Madison
 - the US 421-KY 36 intersection in Milton
 - steep grades with no shoulders on Milton Hill

Some shippers indicated they would use longer detour routes if the US 421 Bridge were closed instead of using the KY 36-Markland Dam-SR 56 route because of these deficiencies.

Based on input received during the freight survey, correcting the geometric and structural issues associated with the existing US 421 Bridge is not going to significantly alter commercial vehicle travel patterns or route selection for the region. Widening the US 421 Bridge would improve existing safety issues but is unlikely to attract new truck traffic to the area; short distance, local truck trips use the bridge today and would likely continue to do so. However, geometric constraints on US 421 beyond the bridge make it a poor alternative to interstate travel for long distance trips.

The Annual Average Daily Traffic (AADT) on the US 421 Bridge was estimated from the traffic forecast for the 2008 Existing, 2011 Build, and 2032 Build scenarios. The Proposed Action is not expected to generate additional traffic when compared to the No Build Alternative, with the exception of heavy vehicles¹. Heavy vehicles (buses, medium, and heavy trucks) compose an estimated 4% of the AADT in all three scenarios; in the No Build Alternative, the bridge would remain closed to heavy vehicles because of the deteriorating structural condition. The estimated AADT and percent heavy vehicles on the bridge is shown in Table 4.1.

TABLE 4.1 Annual Average Daily Traffic & % Trucks		
	2008 Existing	2032 Build
ADT (vehicles per day)	10,300	12,900
% Trucks	4%	4%

Intersections at either end of the bridge operate with acceptable levels of service during the AM and PM peak hours with minimal delays in both the 2008 Existing and 2032 Build scenarios.

¹ Based on the current 15 ton weight limit, heavy trucks (2% of the total traffic volume) are prohibited from crossing the bridge today and would be unable to cross in the No Build Alternative.

Dense concentrations of access points lead to periodic vehicle back-ups on either end of the bridge as vehicles wait to make left turns.

Long term, the No Build Alternative would result in the continued deterioration and eventual closure of the US 421 Ohio River Bridge. This would eliminate existing cross-river travel patterns. Motorists traveling between states would have to divert to one of the adjacent river crossing locations: Markland Dam (26 miles upstream) or the I-65 Bridge in Louisville (46 miles downstream). This would lead to a corresponding change in traffic on connector roads leading to these facilities: primarily SR 56 and KY 36. The social and economic impacts of this closure are discussed in the following sections.

The Proposed Action would have a similar impact on traffic patterns during the estimated 12-month closure of the bridge to replace the superstructure. During the closure period, a free ferry service would maintain traffic flow between communities, although it would not be able to serve the total traffic volumes crossing the bridge. Estimates show that a two ferry system operating 24 hours per day, seven days per week would be able to service approximately 40% of the daily traffic volume demand projected to cross the bridge in 2011. (See **Appendix F** for additional ferry service documentation and supporting assumptions.) Long term, the Proposed Action would result in a new river crossing that would be able to continue serving the communities for another 50-80 years. Following its completion, the Proposed Action would not change the existing travel patterns, although it does improve cross-river access.

4.2 Socioeconomics

The following subsections contain discussions on land use, community resources, farmlands, property impacts, environmental justice communities, bicycle/pedestrian facilities, and economics. Additional information regarding the existing conditions and potential impacts is published in the *Socioeconomic Baseline Report* for the project, available on the project website.

4.2.1 Land Use

Madison – The city of Madison is located in Jefferson County, Indiana and is the county seat. The greatest concentration of development within the study area occurs within the Madison city limits and the immediately surrounding area. The city is divided into regions by the natural terraces formed in the limestone bluffs surrounding the Ohio River. Lower Madison contains the historic downtown area and National Historic Landmark District and exists on the second and third terraces above the river. Upper Madison contains a collection of newer developments, situated on top of the ridge. Development in the city is guided by the 1999 *Hanover, Madison, and Jefferson County Comprehensive Plan*; **Figure 4.1** shows the zoning guidelines established by the Planning Commission for the city of Madison.

Downtown Madison consists primarily of residential uses, mixed with some business and industrial. This is the most densely populated section of the study area. Land bordering Vaughn Drive along the river is mostly open green space used as parkland. The downtown area has a thriving, well-kept business district that includes many historic buildings concentrated along Main Street. Businesses along Main Street range from banks and restaurants to salons, clothing stores, hotels, antiques dealers, and boutiques. The historic downtown area attracts thousands of tourists to the area each year.

The Proposed Action would provide a safer, more reliable cross-river link that would be able to continue serving the communities for another 50-80 years. This would preserve and support the existing land use and growth patterns. During the 12-month bridge closure period for replacement of the superstructure, motorists would have to detour through the Markland Dam crossing or take the ferry between communities. There would likely be a short term impact on the business community but no cumulative changes in land use patterns.

4.2.2 Community Resources

Community resources within the study area range from government services, healthcare, and education to religious centers, parks, and other recreational facilities. Both Milton and Madison contain a number of resources utilized by each community. The US 421 Ohio River Bridge is a vital part of everyday life for many, supporting the connectivity between communities. Citizens of Milton, Madison, and surrounding areas often find necessary goods, services, health care, and employment located on opposite sides of the Ohio River. The US 421 Bridge over the Ohio River is vitally important in sustaining the interdependence between the communities in both states.

Either alternative being considered would have an impact on travel patterns and mobility. The existing bridge provides a vital link between communities.

In the No Build Alternative, mobility and travel patterns in the area would continue to function similarly to the existing conditions for approximately the next ten years. The bridge would remain restricted to vehicles over 15 tons, but passenger cars and light trucks would have unrestricted access between communities via the US 421 Bridge. Once the bridge condition deteriorates to an unsafe level, the bridge would be closed and access between the communities would be severed entirely. This would increase trip lengths for motorists travelling cross-river to access jobs, health services, retail facilities, and tourist destinations or would cause travelers to divert to other destinations on the same side of the river to access similar facilities.

In the Proposed Action, there would be a short term impact on mobility during the bridge closure for construction. The closure period is estimated to last up to 12 months during the replacement of the superstructure. During this time, motorists would have to detour to the Markland Dam crossing or use the ferry service between Milton and Madison. The increased travel times and distances would potentially have an economic impact on residents and the business community. The ferry service during the closure period would help to reduce this economic impact by providing a direct link between communities at no cost to users. Following construction, the Proposed Action would provide a level of cross-river access similar to what is provided today, preserving the connection between communities and resources.

The community features most likely to be impacted are discussed in the following subsections. A more thorough description of other community resources – including neighborhoods, schools, libraries, and churches – is presented in the *Socioeconomic Baseline Report*, available on the project website.

4.2.2.1 Healthcare Facilities

Madison is home to King's Daughters Hospital, the emergency medical care facility for the larger region. The hospital is currently located in Lower Madison with plans to relocate to the hilltop in the future. King's Daughters Hospital also maintains office facilities in Milton, Carrollton, Hanover, Vevay, and Versailles. The next nearest hospitals are located in

Carrollton, Kentucky (15 miles), North Vernon, Indiana (25 miles), La Grange, Kentucky (30 miles), or Scottsburg, Indiana (35 miles).

In addition, Madison contains numerous doctor's offices and pharmacies in both Upper and Lower Madison. The Madison State Hospital is a psychiatric hospital, located west of downtown Madison.

Serving the city of Milton, the Trimble County Medical Building is located along US 421 in Upper Milton and provides non-emergency healthcare services. For more specialized needs, residents must travel to King's Daughters Hospital in Madison or to the Carroll County Hospital in Carrollton. The nearest pharmacies are located in Madison, Bedford, or Carrollton.

The No Build Alternative would eventually result in a loss of cross-river access, increasing the distance between the population of Trimble County and the nearest emergency medical center.

In the Proposed Action, the estimated 12-month closure of the bridge to replace the superstructure would restrict access for healthcare patients and emergency responders. An emergency helicopter service would be provided during the closure to offset increased travel times for emergency medical situations between Trimble County and the King's Daughters Hospital in Madison. This will ensure emergency responders and residents of Trimble County are able to reach necessary care facilities in a timely manner, minimizing impacts associated with the temporary closure.

4.2.2.2 Parks and Recreational Facilities

Multiple parks and public recreational facilities are located within the study area, several near the US 421 Bridge. Although no direct acquisition will be necessary from these facilities, indirect impacts from construction are possible, due to the recreational facilities' proximity to the bridge. Publicly owned parks and recreation areas are protected by Section 4(f) of the US Department of Transportation Act. By law, these properties may not be converted to transportation uses without meeting a stringent set of requirements; Section 4(f) resources and impacts are discussed in more depth in **Chapter 8**.

Jaycee Park in Madison covers two acres immediately south of the Indiana bridge abutment. The park contains three volleyball courts, playground equipment, two pavilions, a basketball court, a river walk, and a parking area. The 2007-2012 *Parks and Recreation Master Plan* includes the future replacement of both shelters and upgrades to the playground equipment.

In the No Build Alternative, the park would not be affected until the bridge deteriorates to a level that it must be demolished. At that time, the park would likely be needed for staging and storage to facilitate demolition, although additional right-of-way would not be needed.

In the Proposed Action, portions of Jaycee Park would potentially be used for construction staging. This would result in some areas being converted to a temporary construction use during the two year construction period. Recreational resources that could be affected by this short term conversion (e.g. the volleyball courts and eastern picnic shelter) would be relocated to nearby locations beforehand. Thus, there would be no interference with the park or its activities, features, and attributes; Jaycee Park would be able to continue meeting the same recreational needs as it does today. Following construction, the facilities and the grounds within the park would be returned to their existing condition or better.

The Madison City Campground is located on the north side of the Ohio River just east of Ferry Street. The campground covers two acres and provides electrical and water hook-ups for 34 campsites. RV campsites are available for a fee on a daily or weekly basis. The grounds are also equipped with a full bathhouse facility and dump station. The camping season runs from April through October. The 2007-2012 *Parks and Recreation Master Plan* calls for a comprehensive renovation of the campground, including repairing RV stalls, replacing the bathhouse, and relocating the dump station.

The No Build Alternative would have no impact on the campground. In the Proposed Action, the campground would be converted to a ferry staging area during the bridge closure period of up to 12 months. Following replacement of the bridge superstructure, the campground would be renovated to mitigate project impacts, in line with the improvements described in the *Parks and Recreation Master Plan*.

Milton City Park, on the south side of the river, contains open green space, a baseball field, playground equipment, a multi-use path for cyclists and pedestrians, a covered picnic shelter with tables, and a parking area. The park is bounded by Spring Street to the west, KY 36 to the north, Canip Creek to the east, and a wooded ridge to the south. Neither the No Build nor the Proposed Action would impact the use of the city park.

The boat ramp in Milton immediately east of the bridge is the only public facility in Trimble County to launch watercraft on the Ohio River. The next nearest boat ramp is in Carrollton, approximately 12 miles away.

The No Build Alternative would have no impacts on the boat ramp. For the Proposed Action, to help mitigate the economic impact, the Milton boat ramp would be converted to a ferry staging area during the closure period for the replacement of the superstructure. This would make the ramp unavailable for public use during the construction closure period. Another ramp would be constructed nearby for public use during the closure period to compensate for the short term loss of the existing launch.

As an enhancement to the Proposed Action, funding would be provided for a Master Plan for the Milton Riverfront. This measure was suggested by the city of Milton because the bridge would provide a new cross-river connection for bicyclists and pedestrians but the existing sidewalks within Milton are not continuous. The Master Plan project would provide an opportunity to plan for a continuous bicycle and pedestrian network beyond the project limits and to promote safety for all modes of transportation. The Master Plan would allow Milton to apply for federal Transportation Enhancement funding in the future to implement any recommendations resulting from the study.

4.2.2.3 Retail and Services

Within the immediate vicinity of the bridge, there are travel-oriented businesses lining US 421. Businesses in Lower Milton capture pass-by commuter trips traveling between employment centers in Madison and Carrollton. For example, lower state taxes on tobacco products in Kentucky encourage Indiana residents to travel to Milton to purchase cigarettes and other tobacco products. Indiana residents traveling to Kentucky may also purchase fuel since Kentucky has a lower state gas tax than Indiana. Because Trimble County is a “dry” county and liquor sales are prohibited, Madison is the nearest place for Trimble County residents to purchase alcoholic beverages. In the Proposed Action, these businesses would potentially experience a temporary drop in sales revenues when access is limited due to the short term

closure of the bridge. For the No Build Alternative, the loss in access and associated effects would be permanent once the bridge is closed to traffic.

Potential economic impacts to the Historic Districts and mitigation measures are discussed in **Section 4.2.7** of this document.

4.2.2.4 Cumulative & Indirect Impacts

Long term, the No Build Alternative would result in the elimination of the existing river crossing. This would create a shift in travel patterns and change access to groceries, pharmacies, retail stores, and other resources for residents. Businesses in both communities would be left with a reduced customer base depending on the number of customers crossing the river. A survey of 40 local business owners in the two communities estimated that an average of 37% of customers come from the opposite side of the Ohio River. An estimated 700 workers commute from Trimble County to Jefferson County, Indiana² while an estimated 1,200 workers commute from Jefferson County, Indiana to somewhere in Kentucky³. Without the bridge, a number of commuters working in the opposite state would face increased travel times/distances/costs to travel to work. Employers would have a smaller pool of potential employees to draw from if the bridge did not provide a local link between communities.

In the long term, the Proposed Action would sustain the existing travel patterns and community resources that have developed within both communities. This alternative would provide a safer, more reliable cross-river link. Replacement on the superstructure would create a new river crossing that would be able to continue serving the communities for another 50-80 years. The proposed roadway improvements lie totally within state-owned right of way. No long term adverse indirect or cumulative impacts to existing community resources would result from this alternative.

4.2.3 Farmlands

Within both Jefferson and Trimble Counties, much of the land area is dedicated to rural uses: croplands, pastures, and forested lots. Within developed areas of Madison, agricultural land uses are less prevalent. Prime farmlands are shown in **Figure 4.3**, along with other environmental constraints in the study area. Although prime farmlands are present in the counties, the project itself is located within the city limits of both Milton and Madison where most of the land has been developed to urban uses. Also, the project is contained within existed state owned right-of-way. Because neither alternative converts additional right-of-way to transportation uses, no direct, indirect or cumulative impacts on agricultural areas or development patterns are anticipated. Neither the No Build Alternative nor the Proposed Action would result in the loss or conversion of any prime or unique farmlands or farmlands of statewide or local significance.

4.2.4 Property Impacts

Because both the No Build Alternative and the Proposed Action require no new right-of-way acquisition, there would be no residential or business displacements with either alternative. The *Socioeconomic Baseline Report*, available on the project website, contains additional details about the existing conditions and available properties.

² 2000 US Census data

³ 2007 data from the Indiana Business Research Center, online at www.stats.indiana.edu

The closure of the bridge would lead to a negative economic effect on the entire populations of both communities, including environmental justice populations. The detour to the next nearest Ohio River highway crossing is in Markland, a 50-mile round trip detour. A number of residents would be forced to find transportation to businesses located 10 miles or more away, compared to finding transportation to locations roughly 2 miles away today. Economic impacts are discussed further in **Section 4.2.7**.

For the Proposed Action, a free ferry service would be provided between communities during the 12-month bridge closure period to help offset these impacts. INDOT and KYTC have committed to covering the cost of the ferry; no fee would be charged to users to cross the river. The ferry would be able to provide a cross-river link for both motorists and cyclists/pedestrians. This would help to mitigate the adverse economic and access impacts of the project while it is under construction.

The Proposed Action would also provide a long term connection between communities for pedestrians and bicyclists. The sidewalk and bike path would provide a connection for residents that currently do not have access to a vehicle, a benefit for low income groups living near the bridge.

4.2.6 Bicycle & Pedestrian Facilities

The short distance between Milton and Madison provides an ideal opportunity for residents and visitors to travel by non-motorized transportation modes. Both communities currently provide a number of bicycle trails, hiking paths, and sidewalks to facilitate movement, shown in **Figure 4.6**.

Today, there is no connectivity between Milton and Madison for non-motorized modes of transportation because of the narrowness of the bridge and the lack of sidewalks. The No Build Alternative would not change the existing conditions for bicyclists or pedestrians. However, the Proposed Action includes a new Ohio River crossing, complete with a 5-foot bike lane in each shoulder and a cantilevered ADA-compliant sidewalk connection on the truss. This would create a link between sidewalks and trails in both communities that does not exist today.

A pedestrian and bicycle study for Milton would be funded as part of the Proposed Action. This enhancement was suggested by the city of Milton because the bridge would provide a new cross-river connection for bicyclists and pedestrians but the existing sidewalks within Milton are not continuous. This would allow Milton to plan its bicycle and pedestrian connections/routes. Having the plan in place would allow Milton to apply for future federal Transportation Enhancement funding in the future to complete identified bicycle/pedestrian improvements.

4.2.7 Economics

An economic analysis was conducted for the No Build Alternative and the Proposed Action to determine what impacts the bridge closure and superstructure replacement would have on the regional economy. This analysis measures three separate components: (1) changes in transportation costs related to the bridge closure, (2) impacts due to construction expenditures to build the new truss, and (3) impacts on businesses and industries related to the bridge closure. (It should be noted that the results from the first component should not be added together with the other two components, because the impact to business partially reflects the increased transportation costs from the bridge closure. Combining the results would produce a "double counting" of costs as a result of adverse travel.)

These factors are described in the following sections. Additional detailed information about the economic analysis is included in **Appendix E**.

4.2.7.1.1 Increased Transportation Costs

This measure describes how transportation costs would increase due to the closure of the bridge. Increased costs would result primarily from increased travel times and distances for passenger cars and commercial trucks. A number of trips traveling between communities today would not necessarily cross the river if the bridge were closed. A number of people would decide not to make a trip, divert to another destination on the same side of the river, or carpool. The remaining motorists would have to either detour to the Markland Dam crossing or, as part of the Proposed Action, ride the ferry. Based on outputs from the travel demand model and basic assumptions about the ferry service (described in the Ferry White Paper in **Appendix F**), increased transportation costs were estimated for two scenarios: closure of the US 421 Bridge with and without a free ferry service between Milton and Madison.

Considering average increases in travel times and distances, the monetary value of time for vehicle occupants and freight cargo, fuel costs, emissions, crash frequencies, crash costs, and other cost components, increased daily transportation costs were estimated for both scenarios. If the bridge were closed and no ferry service provided (as in the No Build Alternative), there would be an estimated increased daily transportation cost of \$387,000, relative to the existing condition. Based on the assumed diversion distributions and operating parameters for the ferry service described in the Ferry White Paper (see **Appendix F**), if the bridge were closed and ferry service were provided (as in the Proposed Action), there would be an estimated increased daily transportation cost of \$210,000, relative to the existing condition. In either alternative, the bridge closure is expected to increase regional transportation costs. However, providing the free ferry service would reduce the cost increase by 45% relative to the scenario without ferry services.

The \$210,000 estimate of the daily transportation cost increase with ferry service represents a worst-case estimate. Increased daily transportation costs during the bridge closure would be further reduced if more vehicles diverted to another city or a shorter wait time for the ferry was assumed. To determine a reasonable wait time assumption, the project team conducted informal surveys; public polling in December 2009 indicated less than 2% of respondents would be willing to wait for more than one hour to ride the ferry. The increased daily transportation cost with the ferry service is estimated to be as low as \$166,000 assuming a 30-minute maximum wait time⁴. Additional information about the proposed ferry service and additional costs are discussed in the *Socioeconomic Baseline Report*, available on the project website.

4.2.7.2 Economic Output and Job Impacts

The bridge reconstruction project would affect regional economic output and jobs in two opposing manners. First, the bridge construction in the Proposed Alternative will result in the creation of construction-related jobs and corresponding economic activity. Second, the bridge closure in the No Build Alternative or the Proposed Action will negatively affect regional businesses, whose employees, suppliers, and/or customers would suffer from the severed cross-river connectivity. Economic impacts associated with both components are discussed below, beginning with a brief overview of the impact modeling process and definitions.

⁴ The 30-minute wait assumption is applied to diversion scenario 1 in **Table 10** of **Appendix F** to calculate this cost.

4.3 Cultural Resources

Extensive field work, archival research, and coordination with Section 106 consulting parties were undertaken throughout the project planning process to identify historic resources in the project area and quantify impacts. In line with the National Historic Preservation Act, measures to avoid, minimize, or mitigate harm were identified for the Proposed Action. Historic resources and coordination efforts are discussed further in **Chapters 6 and 7**.

4.3.1 Historic Structures

Approximately 300 individual historic structures were surveyed as part of this project. The project's *800.11e Report* contains information about individual properties, available on the project website.

The National Historic Landmark District in Madison contains approximate 1,800 individual resources that contribute to the district. The district covers a period of significance from 1817 to 1939 and demonstrates historic themes related to its architecture and ethnic heritage. The 2006 National Historic Landmark nomination form, on file with the National Park Service, contains details about themes and contributing historic elements.

The Madison Historic District covers a larger area, including the entire National Historic Landmark District. This district covers a period of significance from 1800 to 1874. It conveys themes of architecture, agriculture, commerce, and transportation. At the consensus of Section 106 consulting parties, the period of significance for the Madison Historic District was extended to 1939 for this project. Of the surveyed properties, 74 resources were identified as contributing elements to the Madison Historic District (beyond the National Historic Landmark). A total of 14 of these structures are considered individually eligible for listing on the National Register.

The Third Street Historic District in Milton lies just north of the Kentucky bridge abutment. The district covers a period of significance from 1850 to 1899 and demonstrates a historic architectural theme. The district contains three contributing structures, all previously listed in the National Register.

The Hunter's Bottom Historic District east of Milton covers a period of significance from 1800 to 1924. It is notable for its themes of architecture, agriculture, exploration/settlement, and commerce. Five properties were surveyed that are considered contributing elements to the Hunter's Bottom Historic District, one of which has been previously listed on the National Register.

Beyond the boundaries of these districts, there is one more property individually eligible for listing in the National Register of Historic Places in Madison, the gatehouse at the southern entry to Clifty Falls State Park. There are four more properties in Milton that have been previously listed on the National Register (103 Ferry Street, the General Store on the corner of Ferry Street, two houses along KY 36, and Richwood Plantation); no other individually NRHP-eligible properties were identified.

The US 421 Bridge itself is also an individually eligible historic resource. The US 421 Bridge has been determined eligible under Criteria A & C. The bridge is an excellent example of an early twentieth century truss bridge, as well as being associated with the J. G. White Engineering Corporation, an influential and important bridge builder of that era. The bridge exhibits integrity as it retains its historic form and much of its original materials.

4.3.1.1 Impacts on Historic Structures

FHWA has made a finding that the Proposed Action, the Superstructure Replacement with Minimal Approaches Alternative, would result in an adverse effect on the US 421 Bridge as the superstructure will be removed. There would be no adverse effects on any other historic property.

Due to the estimated 12-month bridge closure period for construction, the Proposed Action would create a negative economic effect on businesses in the communities. The MOA and this EA also include measures to avoid, minimize and mitigate these economic impacts.

Adverse cumulative and indirect effects to the communities and historic districts could result due to future projects to improve mobility and accessibility to the bridge. The Section 106 Memorandum of Agreement (MOA) addresses measures to avoid, minimize and mitigate these potential impacts by ensuring a consultation process with historic preservationists would be completed as part of any future mobility improvement project on the bridge approaches.

Except during closure of the bridge during construction, the undertaking will not result in increased traffic, changes in traffic patterns and accessibility, or changes in land use, air quality, noise, or vibration that would affect historic structures.

The finding of adverse effect is discussed further in the project's *800.11e Report*, available on the project website, and in **Chapter 7** of this EA. Coordination activities with the Advisory Council on Historic Preservation, National Park Service, and other consulting parties are described in **Chapter 6** of this EA.

4.3.2 Archaeological Sites

Phase I archaeological investigations, including deep testing, are ongoing for areas within the footprint for the Proposed Action and will be completed prior to construction. Several analyses have been undertaken to identify prehistoric sites in the area and, if necessary, ensure impacts to any potentially affected sites are minimized. These include archival research, sonar survey for underwater artifacts, predictive modeling, and a Phase I Assessment of areas associated with the Proposed Action. Methodologies and results of these analyses will be addressed in the *Phase I Archaeological Report* for the project; stipulations in the MOA outline proper steps to be taken for any additional sites discovered.

Archival research yielded information about prehistoric sites on ridgetops and within the floodplain. There is a potential to encounter sites throughout the corporate limits of both Milton and Madison, though previous floods and historic construction could have affected these resources.

A sonar survey of the Ohio River was used to identify potential artifacts below the water surface that could be affected. **Appendix G** contains a record of the findings from this analysis; the exercise identified the locations of a submerged dike and several sunken objects near the existing piers.

Predictive modeling relied on multiple inputs (terrain, presence of water, other resources, travel times) to identify sites within the project area that have a potential to contain artifacts. The model is an adaptation of a National Park Service model and applies different settlement theories to identify potential prehistoric and historic settlements. Results will be documented in the *Phase I Archaeological Report* for the project.

Phase I assessments within the footprint of the Proposed Action included standard shovel probing and deep testing by a geomorphologist. Over 120 test probes around the existing bridge and ferry staging area in Indiana revealed modern materials but no historic artifacts. In Kentucky, over 60 probes were tested east and west of the existing bridge; a number of samples returned modern materials and some artifacts dating back to the early 20th century. Prehistoric artifacts were encountered in Milton east of the bridge and will be documented in the *Phase I Archaeology Report*. As of December 2009, deep testing of the sites is ongoing; results will be documented in the *Phase I Archaeological Report* for the project.

4.4 Visual Environment

The study area is located along the Ohio River, nestled into the terraces of the steep limestone bluffs embracing the river. The terrain in both Jefferson and Trimble Counties is highly dissected, characterized by steep-sided, forested hills intermixed with sinuous ridge tops and narrow stream valleys. Home to numerous historic districts and structures, impacts to the visual environment are a special concern for this project.

4.4.1 Visual Impacts resulting from the No Build Alternative

No major improvements to the river crossing are included in the No Build Alternative. The visual environment would be largely unaffected in this alternative. Over time, the bridge condition would deteriorate to the point that it must be closed to traffic, estimated to occur by 2020-2025. The aging structure would exhibit signs of decay under close inspection; eventually it would have to be removed. Loss of the structure would have a noticeable effect on the viewshed towards the river from either shore.

4.4.2 Visual Impacts from the Proposed Action

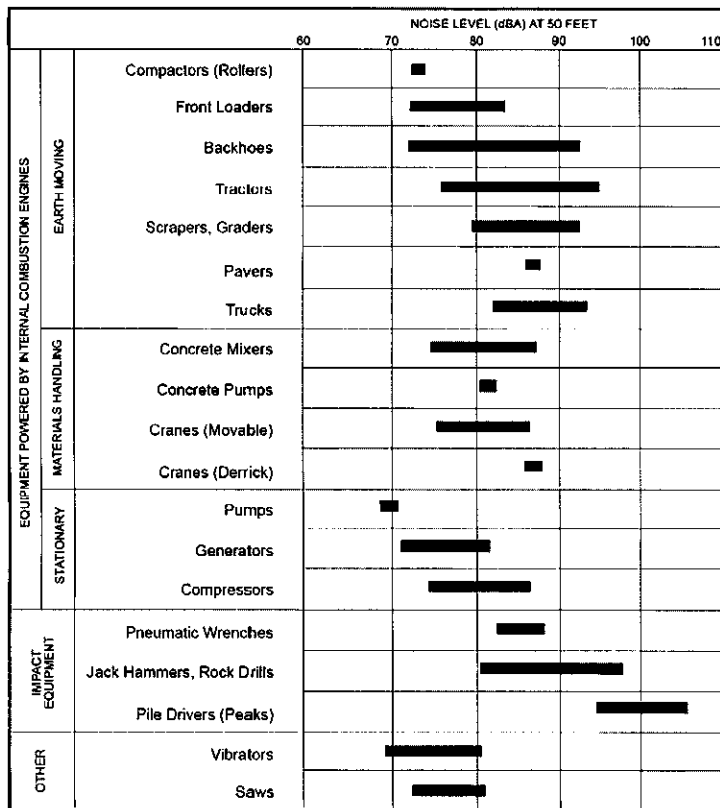
Significant effort went into the preliminary design of a replacement truss that would be aesthetically pleasing to both the public and historic preservation interest groups. During a public meeting in February 2009, preference polling was undertaken to identify visual preferences and gauge viewer reactions based on a large group response. As part of this effort, a variety of bridge images were developed showing different arch, cable-stay, and truss type bridges. Members of the public, PAG representatives, and Section 106 consulting parties were asked to rate bridge images to identify aesthetic preferences like color, complexity, and height. Results of this analysis are documented in the *Bridge Type Selection White Paper*, available on the project website. Different variations of designs for three types of superstructure (a cable-stayed, an arch and a truss) were polled for this project.

Although cable-stayed bridges received high ratings, that type of bridge is not compatible with reuse of the existing piers. A truss with a profile similar to the existing bridge was identified as the favorite structure design option by the Section 106 consulting parties participating. It was rated 'above average' by members of the public participating in the polling.

Additional coordination activities with Section 106 consulting parties, PAG members, and the public have been undertaken to mitigate any adverse visual effects on historic resources due to the replacement of the superstructure. Due to input from these efforts, a truss structure similar to the appearance of the existing bridge is proposed as a replacement.

Figure 4.7 shows a comparison of representative views traveling along the US 421 Bridge. The existing bridge is shown on the left; a rendering of a potential Superstructure Replacement truss is shown on the right.

Figure 4.13 – Typical Noise Levels for Construction Activities



Note: Based on limited available data samples.

The relatively short-term nature of construction noise should not hinder normal community functions. The contractor will be required to comply with Occupational Safety and Health Administration (OSHA) regulations concerning noise attenuation devices on construction equipment.

4.5.2 Vibration Analysis

The methodology outlined in the Federal Transit Administration's research report *Transit Noise and Vibration Impact Assessment*⁵ was applied to analyze potential vibration impacts for the Proposed Action. A common public concern is that ground-borne vibration and noise from trucks crossing the improved bridge will be experienced and may cause structural damage to homes and historic properties.

Because the No Build Alternative includes only minor routine maintenance on the bridge, (frequent inspections and replacement of isolated members), this alternative would not cause any changes in ground-borne vibrations occurring in the existing conditions while the bridge remains open to traffic.

Vibration velocities are measured in decibels (VdB). The threshold for human perception of vibration is around 65 VdB; residential annoyance is in the range of 73-80 VdB. Structural damage is not an issue below 100 VdB.

Analysts calculated vibratory impacts based on vehicle speeds, with adjustments for vehicle parameters, roadway conditions, building characteristics, and the distance between the highway and the building. For the Proposed Action, the total vibration from truck operations on the bridge would be 50.6 VdB, below the threshold for human perception or structural damage.

4.5.2.1 Construction Vibration

Analysts completed a similar calculation to quantify vibratory effects resulting from construction activities associated with the Proposed Action. The approximate level for bulldozers and other heavy track construction equipment is 92 VdB. Pile driving and vibratory compaction would be the two primary sources of construction-based vibration. After applying adjustment factors for vehicle parameters, roadway conditions, building characteristics, and distances, the total construction-based vibration would be around 73 VdB. Residential structures closest to the abutments would be aware of the construction vibration. Although discernable, this level would be below the expected threshold for damage.

Per the Section 106 MOA, monitoring for damage caused by vibration would be installed for one historic structure adjacent to the bridge in each community to measure impacts resulting from the Proposed Action. The contractor would be required to follow each state's standard construction specifications and, if applicable, to use Best Management Practices to address any issues that arise.

Appendix I includes calculations to determine the vibratory impacts described above.

4.6 Air Quality

The project study area is located in the North Central Kentucky Intrastate Air Quality Control Region and in the INDOT Seymour District. This project is part of the 2005-2007 KYTC

⁵ Available online at http://www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf

Statewide Transportation Implementation Program as STIP amendment Number 2004-165 and the 2008-2011 INDOT Statewide Transportation Implementation Program as STIP Designation Number 0501151-4761.

Trimble County in Kentucky is in attainment for the six criteria pollutants established by the US Environmental Protection Agency (EPA). Based on 2001-2003 monitoring data, US EPA designated Madison Township in Indiana as nonattainment for the annual standard for fine particulate matter 2.5 (PM_{2.5}) with a demonstration that the area will meet the annual standard for fine particles by April 2010. It should be noted that the largest source for PM_{2.5} emission within Jefferson County, Indiana is an electricity generating facility located in Madison and not transportation sources or diesel vehicles. Installation of scrubbers at this facility is underway and should correct the issue.

In addition, on October 8, 2009 EPA issued a final Federal Register notice designating areas throughout the U.S. as "nonattainment" and "unclassifiable/attainment" for the 24-hour national ambient air quality standards for fine particulate matter and Madison is not listed as a non-attainment area for the 24-hour national air quality standards for PM_{2.5}.

There are no Traffic Control Measures (TCM) identified in the respective State Implementation Plans (SIP) that are applicable to Trimble County, Kentucky, or Madison County, Indiana.

4.6.1 National Ambient Air Quality Standards (NAAQS)

The US EPA has identified seven air pollutants as being of concern nationwide: carbon monoxide, hydrocarbons, nitrogen oxides, ozone, lead, particulate matter, and sulfur oxides. The impact resulting from a new transportation project or the improvement of an existing facility ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining this impact.

The project area is in attainment for all criteria pollutants in Trimble County, Kentucky and five out of six criteria pollutants in Jefferson County in Indiana. Madison Township in Jefferson County is in non-attainment for PM_{2.5}. The impact of the project to each of these criteria pollutants are described below:

Carbon Monoxide (CO) is the primary pollutant emitted by automobiles. Automobiles are considered to be the primary source of CO pollution for a transportation project. Typically CO emissions are concentrated near intersections where significant idling is observed. Due to the relatively low volume of vehicular traffic, pollution from idling and queuing of vehicles is minimal in the study area. There are no existing violations of CO in the project area. Furthermore, the proposed project will not cause any air quality violations or increase the severity or frequency of existing CO violations within the 2025 study year. Therefore, the No Build Alternative and the Proposed Action would not have a negative adverse impact on CO air quality in the region.

Nitrogen Oxides (NO_x) and Hydrocarbons (HC) are carried into the atmosphere where they react with sunlight to form nitrogen dioxide (NO₂) and ozone (O₃). The photochemical reactions that form O₃ and NO₂ require several hours to occur. For this reason, the peak levels of O₃ generally occur six to 13 miles downwind of the source of HC emissions. Urban areas as a whole are regarded as sources of HCs rather than individual streets and highways. There are no large urban areas within at least 10 miles of the study area. The study area counties are in

attainment for O₃ and NO₂. The No Build Alternative and the Proposed Action would not worsen existing levels of O₃ or NO₂.

Lead (Pb) emissions come from automobiles without catalytic converters. However, the Clean Air Act (CAA) of 1990 made the sale, supply, or transport of leaded gasoline or lead additives unlawful after December 31, 1995. Air quality standards for Pb are being met in the study area and would be unaffected by the No Build Alternative or the Proposed Action.

Automobiles are not generally regarded as significant sources of Particulate Matter (PM_{2.5}). Nationwide, highway sources account for less than 7% of particulate matter emissions. Particulate matter emissions are predominantly the result of non-highway sources (i.e. industrial, commercial, and agricultural). Air quality standards for particulate matter are met in Trimble County, but Madison Township, Jefferson County is in non-attainment for PM_{2.5}.

Automobiles are not generally regarded as significant sources of Sulfur Dioxide (SO₂). Nationwide, highway sources account for less than two percent of SO₂ emissions. SO₂ emissions are predominantly the result of non-highway sources (i.e. industrial, commercial, and agricultural).

Based on 40 CFR 93.126, the Proposed Action (Superstructure Replacement) is an exempt project.

Based on criteria outlined in *The Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM 2.5 and PM 10 Nonattainment and Maintenance Areas* document, a qualitative PM 2.5 hot-spot analysis is not required for this project since it is not an air quality concern. The Clean Air Act and 40 CFR 93.116 requirements were met without a hot-spot analysis, since this project would not be of air quality concern under 40 CFR 93.123(b)(1).

4.6.2 Mobile Source Air Toxics (MSAT)

The Proposed Action would have no potential for meaningful Mobile Source Air Toxics (MSAT) effects. Aside from the period of construction, neither the No Build Alternative nor the Proposed Action would result in any appreciable changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions. As such, the Proposed Action will generate no meaningful MSAT effects.

4.6.2.1 Qualitative Analysis

Based on the 2008 traffic forecast of 10,300 vehicles per day crossing the bridge, the replacement of the existing structurally deficient US 421 Bridge is a project with low potential MSAT effects as defined by the *FHWA Guidance on Air Toxics Analysis in NEPA documents*⁶. The Proposed Action would not increase capacity or result in traffic volume increases. However, the widened facility would allow traffic to operate at higher speeds, leading to a minor reduction in MSAT emissions. According to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases.

For the Proposed Action, emissions would likely be lower than present levels in the 2030 design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent between 2000 and 2020. Local conditions may differ from these

⁶ Available online at <http://www.fhwa.dot.gov/environment/airtoxic/>

national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA projected reductions is so great (even after accounting for project traffic growth) that MSAT emissions in the study area would likely be lower in the future.

The Proposed Action would have no effect on moving traffic closer to nearby homes, schools or businesses; therefore, there would be no localized areas where ambient concentrations of MSATs are higher than the current conditions. However, the magnitude and the duration of any temporary potential increases compared to the current conditions cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is constructed and moves closer to receptors, the localized level of MSAT emissions could be higher relative to the No Build Alternative, but this is often offset by increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). At the same time, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that typically would cause region-wide MSAT levels to be significantly lower than today.

4.6.2.2 Uncertainty Analysis

Air toxics analysis is an emerging field and current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that would result from a transportation project in a way that would be useful to decision-makers.

4.6.3 Greenhouse Gases and Climate Change

Because the Proposed Action for this project is a replacement of the existing US 421 Bridge over the Ohio River on the existing piers with minimal approach construction, no change in greenhouse gas (GHG) emissions would occur. During the two years of construction of the Proposed Action, GHG would increase from the construction vehicles (two years), operation of the ferry service (one year) and the vehicles detouring to Markland Dam (one year). However this increase would not be significant when compared to the No Build Alternative, which would ultimately lead to the closure of the bridge and traffic being detoured via Markland Dam permanently. This temporary increase in GHG for two years during construction would not have a significant contribution to climate change since it will be short term in duration.

4.6.4 Summary of Air Quality Impacts and Recommended Mitigations

Because of minimal changes in traffic volumes or composition, the Proposed Action is not anticipated to cause an increase in air pollutants. No cumulative or indirect impacts will result from construction activities or replacement of the superstructure.

During the construction of the Proposed Action, construction activity would generate a temporary increase in air quality issues. These temporary impacts would include dust emissions generated by the construction of the new bridge and the demolition of the existing structure. Emissions related to construction equipment and emissions from construction-generated traffic or diversions of traffic would arise during construction of the Proposed Action. Project-level construction MSAT mitigation measures may include strategies that reduce engine activity or reduce emissions per unit of operating time, such as reducing the numbers of trips or extended idling. Measures in accordance with the appropriate construction specifications and applicable local laws and ordinances will be taken to reduce the dust generated by construction for the protection and comfort of motorists and residents in the area. Any increase in air pollution from construction would be temporary in duration and would be a nuisance and

annoyance rather than an impact to the health of residents. While this cannot be avoided, it will be minimized by requiring the contractor to follow the proper construction techniques in accordance with INDOT and KYTC construction specifications and INDOT's *Construction Activity Environmental Manual* for controlling airborne particles during construction. Additional information about the existing conditions and air quality analyses performed for the project are presented in **Appendix J** to this document.

4.7 Ecological Resources

The project area is located in a temperate climate, with average temperatures varying from 40°F in winter to 75°F in summer. The area receives around 45 inches of rainfall annually. The region is characterized by a steep, rolling topography dissected by small stream valleys. The Ohio River forms a natural division between Indiana and Kentucky. Elevation of the study area ranges from 450 to 850 feet above sea level. Many of the lower elevations of the project area lie within the 100-year floodplain. Limestone and shale bedrock underlies most of the region. **Figure 4.3** presents key features of the natural and man-made environment.

Additional information about the environmental setting and baseline conditions of the project area is included in the *Environmental Overview Report*, available on the project website, and in the *Aquatic and Terrestrial Baseline Assessment*, included as **Appendix K** of this EA.

Analysts conducted literature reviews, corresponded with state and federal resource agencies, and performed field surveys to determine if unique or sensitive ecological resources were present within the project area. The following sections describe the results of these analyses.

4.7.1 Floodplains

Built on the banks of the Ohio River, large portions of both Milton and Madison lie within the 100-year floodplain, as pictured in **Figure 4.14**. Because the Proposed Action replaces the existing bridge superstructure, there would be minimal, if any, changes in the floodplain. The Proposed Action would require construction activities within the floodplain to complete the expansion of the bridge abutments, demolition of river pier 5, scour mitigations on the existing piers, and construction of new land piers for the approaches. Hydraulic modeling and coordination with resource agencies is underway to document that the Proposed Action would result in a "no rise" certification compared to the existing condition. Additional coordination with the Kentucky Division of Water, the Indiana Department of Natural Resources, and the US Army Corps of Engineers will be undertaken to ensure state and federal regulations are met, as discussed in **Section 4.10**.

Because there are minimal approach improvements included in the Proposed Action, the Kentucky approach to the bridge would remain within the 100-year floodplain. The No Build Alternative would have no impact on floodplains within the study area.

4.7.2 Wetlands

National Wetlands Inventory mapping reviews and a windshield survey of the study area in August 2008 identified wetlands in the study area in both states, shown in **Figure 4.15**, primarily due to stream corridors and numerous small farm ponds. Riparian vegetation was identified in higher gradient areas, but is almost entirely absent within the Ohio River floodplain. No wetlands were identified in the immediate vicinity of the bridge or ferry staging areas. Summary details about wetlands are discussed in the *Environmental Overview Report*, available on the project website.

No wetland impacts would result from either the No Build Alternative or Proposed Action. Section 404 and Section 10 permits will be coordinated with the US Army Corps of Engineers prior to any work in the river for the Proposed Action.

4.7.3 Water Quality and Streams

The project is located in the Middle Ohio River watershed (HUC# 05090203) and is bisected by the Ohio River. At this location, the river flows generally east to west between the states, curving to the south after passing the western boundary of Madison. A number of smaller streams traverse the project area, typically flowing intermittently due to the steep terrain. Aside from the river, none of the streams are in the immediate vicinity of the Proposed Action. Figure 4.14 depicts streams in the project area. State databases show no Outstanding or Wild Rivers in the study area.

Several wells, tanks, and pumps are located through the study area, supplying water to area residents. Approximately 300 residents of Trimble County rely on well water drawn from the Ohio River alluvium or from within creek valleys. Approximately 140 wells tap the Silurian and Devonian aquifer in Jefferson County, Indiana. The Ohio River Outwash aquifer is another significant water source: five registered groundwater withdrawal facilities currently use or have used this aquifer system.

A water quality assessment and an aquatic field survey were conducted, consisting of biological, chemical, and physical (habitat) investigations. Field sampling was conducted in order to establish baseline conditions for each resource and to evaluate overall community health. Data was collected from the Ohio River, Tiber Creek (in Milton), an unnamed tributary to Canip Creek (in Milton), and an unnamed tributary in Indiana. Additionally, information was collected from a reference station in Canip Creek and from one wetland within the Milton City Park.

4.7.3.1 Water Quality Measures

A summary of water quality results obtained from the four stream sampling locations is included in Appendix K.

4.7.3.2 Macroinvertebrates & Fish Sampling

All stations were low in macroinvertebrate taxa richness. The low diversity may be a reflection of both a lack of in-stream habitat and reduced water quality. Fish sampling at Tiber Creek resulted in a 'poor' rating in the Kentucky Index of Biotic Integrity and a 'good' rating for Canip Creek.

4.7.3.3 Mussel Sampling

A mussel survey was conducted in June 2009. The purpose of this survey was to determine the potential for threatened and endangered species to occur in the area of the proposed alternatives. As of 2008, the United States Fish and Wildlife Service lists six federally threatened or endangered mussel species that have the potential to occur in the project area: orangefoot pimpleback (*Plethobasus cooperianus*), pink mucket (*Lampsilis abrupta*), ring pink (*Obovaria retusa*), clubshell (*Pleurobema clava*), fanshell (*Cyprogenia stegaria*), and rough pigtoe (*Pleurobema plenum*).

The primary causes for decline in each mussel species listed in the project area are similar. Impoundments and the subsequent loss of free-flowing conditions result in an array of drastically different habitat conditions including loss of riffles and runs, changes to water chemistry, and potential isolation from host species. Also, erosion caused by strip mining,

logging, and farming practices has led to increased siltation in many rivers. Other threats include pollution from agricultural and industrial runoff. Another more recent threat associated with big river systems is the introduction of the exotic zebra mussel (*Dreissena polymorpha*). Zebra mussels are a highly prolific species capable of out-competing native mussel species for food and space, directly interfering with native mussel reproduction.

No endangered species were encountered during the field survey. A total of 30 individuals representing 10 species were collected. Approximated mussel densities were very low and no juvenile mussels were observed during the field study. Because no listed mussel species were encountered, construction activities are not likely to adversely affect these species.

4.7.3.4 Potential Impacts to Aquatic Species & Habitats

Potential impacts to aquatic habitats and species associated with the Proposed Action are listed below. By constructing the new bridge at the site of the existing US 421 bridge and reusing the river piers, potential impacts to threatened and endangered species would greatly be minimized.

Reusing three river piers and eliminating one river pier would greatly reduce the in-river footprint for construction activities and reduce the potential for impacts to mussel habitat. The elimination of pier 5 would create the potential for new habitat to be established in the old pier's footprint.

Some construction activities would have the potential to disturb mussel habitats or individuals. Dredging at three piers, removal of pier 5, and the creation of two proposed staging areas and two ferry landings could disturb mussel habitat. Demolition activities that result in bridge materials being dropped into the Ohio River could result in the death of mussels. Pieces of dropped materials that are not retrieved could result in the loss of habitat. Temporary bents driven into substrate could result in mussel death via crushing. Installation of scour mitigation structures at the base of each river pier could result in mussel death. Demolition of pier 5 could result in pieces of pier being dropped into the Ohio River, resulting in the death of mussels. All aforementioned activities would potentially result in temporary re-suspension of sediment. This could result in mussel death and/or loss of habitat upon resettling downstream. Also, rock installed as part of scour mitigation could have similar effects.

Activities within the staging areas would likely result in increased erosion and sedimentation. Improvements at ferry landing locations may result in increased erosion during construction and increased runoff during completion.

No additional indirect or cumulative effects on streams, water quality, or aquatic habitats are anticipated to occur.

A number of impact minimization measures are discussed in the project's Biological Assessment (see **Appendix L**) and have been coordinated with the US Fish and Wildlife Service (USFWS) to ensure impacts to mussel habitat will be minimized.

- Use of a barge-mounted suction dredge for all dredging activities would minimize re-suspension of sediment as a result of dredging.
- Only the minimal area required to complete construction activities – pier scour mitigation, staging areas, ferry landing sites – should be dredged. Dredged materials should be stored such that they will not re-enter the Ohio River during de-watering.
- The minimum necessary number of bents should be used during bridge construction.

When the nest box is removed during construction of the US 421 bridge in the Proposed Action, the Kentucky Department of Fish and Wildlife Resources (KDFWR) recommends installing a nest box at a safe location as soon as possible. Coordination activities will continue with KDFWR to identify a relocation site for the nest box and the timing of the relocation to ensure that impacts to the falcon during construction are minimized. **Appendix O** contains a copy of correspondence with KDFWR regarding the falcons.

4.7.5 Agency Coordination

A biological assessment was completed for the project and submitted to USFWS for review. In October 2009, the agency concurred with the findings in the biological assessment – the Proposed Action is “not likely to adversely affect” listed mussel species and will have “no effect” on Indiana bat or running buffalo clover – and agreed that the document satisfied requirements of Section 7 of the Endangered Species Act. A copy of the report and correspondence from USFWS are included in **Appendix L** of the EA.

4.8 Hazardous Materials

An assessment of hazardous materials and underground storage tanks was performed to identify recognized environmental conditions present on parcels located near the project corridor for the Proposed Action. A description of all known hazardous materials and underground storage tanks within the study area is included in the *Environmental Overview Report*, available on the project website. The assessment included an electronic review of applicable environmental databases, site reconnaissance, aerial and topographic mapping reviews, and interviews with individuals knowledgeable about the project area.

The No Build Alternative would have no impacts on hazardous materials or underground storage tanks.

The Milton Save property (west of the bridge on Coopers Bottom Road) is a known location of contaminated soil. However, the Proposed Action would not impact this property. Likewise, this property would not be expected to create an environmental condition for the proposed bridge replacement due to the fact that minimal approach work is anticipated near this property.

Lead-contaminated soil was historically present beneath the Milton bridge approach as a result of previous bridge paintings. However, 1999 remediation efforts removed the contamination and clean closure was granted from the Kentucky Division of Waste Management Superfund Branch.

The existing US 421 Bridge was surveyed for asbestos-containing materials and no asbestos containing materials were found on the main spans or the approach spans.

The project area contains environmental conditions in the vicinity of the Proposed Action; however, none of these would impact the proposed superstructure replacement as no new right-of-way will be acquired. No cumulative or indirect impacts would result.

4.9 River Navigation

Impacts to commercial and recreational river navigation will occur during construction of the Proposed Action, although there will be minimal long term changes for river traffic. From March

2008 through March 2009, a total of 4,563 commercial barges, 1,018 recreational watercraft, and 124 other vessels were recorded passing through the nearby Markland Locks⁷.

The No Build Alternative would have no impact on river navigation until the bridge deteriorates to an unsafe condition and must be demolished.

For commercial traffic, the existing navigation channel has a horizontal clearance of 710.5 feet and a vertical clearance of 95 feet. Under the Proposed Action, the horizontal clearance will not change, and the vertical clearance will be reduced by no more than 5 feet. Final design details will be determined by the contractor, but ongoing coordination with the US Coast Guard will ensure that impacts to commercial traffic are minimized.

A number of recreational boaters rely on public boat ramps in both Milton and Madison for access to the Ohio River. Impacts to these ramps are discussed further in **Chapter 8**. In-river construction activities will have an impact on recreational boaters, including temporary closures of the main navigation channel. The USCG would require a minimum clear channel width during construction in the navigation channel; recreational boaters would have to use this same passage when pier construction or demolition activities make other channels unsafe.

Additionally, the Madison Regatta is a nationally acclaimed hydroplane race that occurs each July in Madison, attracting thousands of visitors to the area. The powerboats travel a closed course that currently passes beneath the existing US 421 Bridge. Construction activities for the Proposed Action will be coordinated to minimize impacts to the Regatta festival during 2010-2011 construction seasons.

4.10 Construction Activities

Coordination will be undertaken with state and federal regulatory agencies prior to construction of the Proposed Action to secure the appropriate permits for all project activities.

- Section 401 Water Quality Certifications will be pursued through both the Kentucky Division of Water and the Indiana Department of Environmental Management prior to construction.
- A permit for construction along or across a stream will be required through the Kentucky Division of Water since construction activities will occur within the Kentucky portion of the 100-year floodplain.
- The project will require formal approval from the Indiana Department of Natural Resources for construction in a floodway under the Indiana Flood Control Act.
- A Section 404 permit from the US Army Corps of Engineers is required before dredged or fill material may be discharged into waterways or wetlands.
- A Section 10 permit is required from the US Army Corps of Engineers to do work in, over, or under a navigable waterway.
- A National Pollutant Discharge Elimination System (NPDES) permit from both the Kentucky Division of Water and the Indiana Department of Environmental Management will be secured by the contractor.

Appropriate mitigation measures would be incorporated into design plans and construction specifications for the Proposed Action to reduce and, if possible, eliminate impacts to the human and natural environment. Many potential impacts would not require any special mitigation

⁷ Based on phone conversation with Markland Lockmaster on March 18, 2009.

measures since the current edition of each state's Standard Specifications and Best Management Practices will address these issues.

Construction-related activities for the Proposed Action would result in a number of short-term impacts to nearby development in either community. Construction activities would likely result in short-term noise, vibrations, changes in air quality for the immediate vicinity, modified traffic patterns and access, altered runoff patterns, and visual effects. Coordination with officials in both communities would be undertaken to ensure construction impacts on major festivals (e.g. the Madison Regatta, Chautauqua Art Festival, and others) will be minimized.

Noise and vibrations (discussed previously) would be from heavy equipment movement and construction activities. Noise and vibration levels due to construction activities would vary depending on the types of equipment used, the location of the equipment, and the operating mode. Any impacts resulting from construction noise and vibration would be minor, temporary, and limited to properties closest to the existing bridge. While no structural damage should occur because of construction vibration, two historic structures immediately adjacent to the bridge approaches would be monitored by the contractor for construction vibration damage. The contractor would be required to follow each state's Standard Specifications and, where applicable, use Best Management Practices to address these issues.

Air quality impacts would be temporary and would primarily result from emissions from diesel-powered construction equipment and dust. Air pollution associated with the creation of airborne particles would be effectively controlled in accordance with the Standard Specifications for INDOT and KYTC and through the use of Best Management Practices. After construction is complete, air quality levels would return to the existing conditions.

The contractor would be responsible to ensure that local access from US 421 to nearby homes, businesses, and community attractions is preserved during the construction period for the Proposed Action.

Construction in or near waterways and water quality impacts resulting from erosion and sedimentation would be controlled in accordance with INDOT's Standard Specifications and KYTC's Standard Specifications for Roads and Bridges and through the use of Best Management Practices. The contractor would be required to submit an Erosion Control Plan, in accordance with the EPA's National Pollutant Discharge Elimination System permitting process. Waste, borrow, and dredged materials would be stored in a location and manner to minimize water quality impacts.

Visually, construction of the new bridge would also have an impact on the communities. Throughout the two year construction period, a number of the scenic riverfront visual elements would be disrupted. For residents living along the river in either community, storage of construction equipment and materials in staging areas around the bridge could be visually displeasing. However, this would be a temporary condition and should pose no substantial problem long-term since each staging area will be return to its original condition or better.



Chapter 5

Preferred Alternative

Since the beginning of the Milton-Madison Bridge Project in August 2008, several factors have arisen which have guided the project team to select the Superstructure Replacement Alternative with Minimal Approaches as the Preferred Alternative. The following sections discuss the reasons for this selection.

5.1 Condition of the Existing Bridge

Multiple inspections of the existing US 421 Bridge have been undertaken over the past few years. The *Needs and Deficiencies Report* includes available inspections from the past 20 years. The findings of the 2009 Fracture Critical Inspection were published as an addendum to this report. Table 5.1 presents the results from previous inspections, based on the National Bridge Inspection Standards developed by the FHWA. These standards rate bridge components on a 0 (failed) to 9 (excellent) scale, based on the overall visible conditions.

Table 5.1 – Condition Ratings for the US 421 Bridge

Component	Inspection Report					
	1995	2000	2002	2006	2009*	2009**
Superstructure	3	6	6	5	4	4
Stringers/Girders/Beams	4	6	6	5	5	5
Floor Beams	3	6	5	4	4	4
Trusses (Main Members)	5	7	6	4	3	4
Trusses (Bracing, Portals)	5	7	7	7	5	4
Substructure	6	6	6	6	6	6

* 2009 Fracture Critical Inspection findings, published March 2009

** 2009 In-Depth Inspection findings, published August 2009

As the table shows, the bridge's condition has deteriorated rapidly over the past decade. This is also shown in the sufficiency rating, which is used to identify structures that may need repair or replacement. Bridges rated 50.0 or less on a scale of 0 to 100 are eligible to receive federal bridge replacement funding. As of 2009, KYTC assigned the Milton-Madison Bridge a sufficiency rating of 6.5, the lowest of any of the eleven Ohio River bridges between Indiana and Kentucky. This rating is based on a variety of factors including structural adequacy, safety,

geometry, the importance of the bridge within the larger transportation network, and other considerations.

Over the past 15 years, KYTC has invested over \$11 million to maintain the bridge in its current condition. This started with a major rehabilitation effort in 1997 to address structural deficiencies. This effort consisted of deck replacement, structural steel repairs, concrete patching, and painting. In the nine years between the 1997 rehabilitation and the 2006 inspection, the floorbeams and main truss members deteriorated substantially to the condition that they are rated as structurally deficient again.

These findings suggest that the bridge has a limited service life remaining. Based on the condition of the aging steel members and the volume of traffic that has crossed the bridge since it first opened to traffic, the bridge will have to be closed to traffic by 2020-2025. Extensive work will be required in the next few years to keep the river crossing open.

5.2 Impacts to Historic Resources and Parks

Historic resources are protected by various federal regulations. Most notably, Section 106 of the National Historic Preservation Act and Section 4(f) of the US Department of Transportation Act protect historic resources from impacts caused by transportation uses. For National Historic Landmarks, Section 110 of the National Historic Preservation Act also provides an added higher level of protection. The following paragraphs explain how these laws affect the decision-making process.

The Section 106 process "seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation ... The goal of the consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties."¹ Coordination with Section 106 consulting parties for the Milton-Madison Bridge Project began in February 2009.

Section 110 establishes a higher standard of care for projects that may directly or adversely affect National Historic Landmarks. Section 110 specifies that projects should "to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark."² Projects should include consideration of all prudent and feasible alternatives that avoid effects on National Historic Landmarks. Impacts to resources within the National Historic Landmark have been determined through consultation with Section 106 parties and are further described in **Chapter 7**.

Section 4(f) protects historic properties and publicly owned parks, recreation areas, wildlife refuges. By law, a Section 4(f) property may be converted to a transportation use only if there is no prudent and feasible alternative and the project includes all possible planning to minimize harm to the resource. A Section 4(f) discussion in **Chapter 8** examines the range of alternatives considered, the effects the Proposed Action creates on 4(f) properties, and measures considered to minimize and mitigate harm.

¹ 36 CFR § 800.1(a)

² Section 110(f) of the National Historic Preservation Act, codified as 16 USC 470

5.2.1 Impacts from the Proposed Action

The Proposed Action is the reasonable alternative that would have the fewest effects on historic properties. The Proposed Action would not result in relocations of historic homes or businesses because no additional right-of-way would be acquired with this alternative. However, it would require removal of the truss itself, a resource determined eligible for listing in the National Register.

In Indiana, the structure spans Jaycee Park with a wider river crossing within the existing bridge right-of-way. It would require construction of new land piers and a larger abutment within the existing bridge right-of-way. These are not anticipated to have an adverse effect on the recreational features of the park. It is possible that areas currently occupied by recreational features (volleyball courts and picnic shelters) may be needed for construction staging. If that is necessary, any amenities temporarily unavailable during construction would be relocated to a nearby space so that their use would not be interrupted. The park is protected under Section 4(f) and FHWA proposes to make a *de minimis* finding for effects on the park, as discussed in Chapter 8.

Because the Ferry Street Boat Ramp in Madison is already permanently closed for public use, it is not considered an active recreational resource. Therefore, it is not subject to Section 4(f) protection. However, the Milton Boat Ramp would be unavailable for public use during the construction period. To offset this loss, the project team would construct a temporary boat launching facility in Milton west of the existing bridge and restore the existing boat ramp to its existing condition or better following use of this property. Potential Section 4(f) issues and coordination are discussed in Chapter 8 of this document.

Every alternative considered would result in the use of Section 4(f) property; therefore, there is no prudent and feasible avoidance alternative for Section 4(f) resources. (Supporting information is provided in Chapter 8.) However, the Proposed Action would have the least overall harm on parks, recreation areas, and historic sites. This alternative minimizes harm to historic resources and incorporates mitigation measures to offset any indirect impacts. Coordination under the Section 106 process helped develop strategies to avoid, minimize, and mitigate indirect adverse impacts on historic resources, outlined in the project's MOA.

5.3 Other Community Impacts

The Proposed Action also has the fewest direct impacts on both communities. It does not require any additional right-of-way acquisition, or displacement of homes or businesses.

However, the Proposed Action would result in a potential short-term negative economic impact to the communities. To construct a replacement superstructure, the cross-river link must be closed to traffic for an estimated 12 months. The economic impact on local residents and business owners was carefully weighed against other concerns during the decision-making process. Both states are committed to mitigating these impacts to the degree possible by providing a ferry service and emergency medical helicopter transport during construction and offering contractor incentives to minimize the length of time the bridge must be closed to traffic. Economic and community impacts are discussed in more detail in Chapter 4.

5.4 Funding Availability

Funding for transportation projects is scarce in today's economy. Both states must balance limited funding to cover many important needs throughout the state. Annually, Kentucky receives \$60 million in federal bridge replacement funding and Indiana receives \$50 million. These funds must be divided among all of the aging bridge structures statewide.

Recent bridge inspection reports show the need to replace the US 421 Milton-Madison Bridge in the near future.

The availability of federal stimulus funding represents an opportunity for the Milton-Madison Bridge Project to compete against other projects around the country. As part of the American Recovery and Reinvestment Act of 2009, the US Department of Transportation is making \$1.5 billion in Transportation Investment Generating Economic Recovery (TIGER) Grants available to state and local governments. TIGER grants are being competitively offered for projects that improve the condition of existing infrastructure, improve regional economic competitiveness, improve quality of life within communities, promote sustainability, and improve safety. Priority is given to projects which can be substantially complete by February 2012.

Because the Proposed Action is contained entirely within existing state owned right-of-way, the lengthy right-of-way acquisition process is not required. By implementing a design-build process, incorporating innovative construction techniques, and offering construction incentive payments for minimizing the closure time of the bridge, this alternative can meet the February 2012 deadline for completion.

5.5 Selection Rationale

The Superstructure Replacement Alternative with Minimal Approaches is the Preferred Alternative because

- It can be constructed before the existing bridge must be closed due to its deterioration.
- It causes the least overall harm to Section 4(f) resources.
- It avoids direct impacts to the National Historic Landmark and other historic resources.
- It requires no structural displacements or partial parcel takes.

Table 5.2 compares the impacts resulting from the Proposed Action to impacts associated with the other four alternatives recommended for detailed study. The Proposed Action impacts fewer resources than the other alternatives considered.

Selection of the final alternative will be completed only after consideration of impacts and public hearing comments.



Chapter 6

Comments

The Milton-Madison Bridge Project has included many opportunities for the public, various stakeholder groups and resource agencies to be involved in the project process. Special outreach efforts were made to involve federal, state, and local governmental agencies under Section 6002 regulations of SAFETEA-LU. Consultation efforts prescribed in Section 106 of the National Historic Preservation Act provided an opportunity for historic preservation groups and interested individuals to take part in the assessment of project effects on historic resources. The Project Advisory Group (PAG), a working group of area residents representing a cross-section of community interests, met regularly to advise the project team and provide a balanced local perspective on project issues.

Besides extensive coordination with local media outlets, several measures were used throughout the project to circulate information to interested parties. Newsletters and other project related informational documents were produced at key milestones and widely distributed. Displays were placed in key locations in both communities. A project website (www.MiltonMadisonBridge.com) was created to distribute documents and to keep the public informed of ongoing project tasks. Paper copies of all documents on the website were made available upon request.

The following sections describe key meetings and other coordination activities scheduled since the project began. Meeting summaries for all public, PAG, and Section 106 meetings are available on the project website.

6.1 Initiation Activities

The Milton-Madison Bridge Project began in the summer of 2008. A Notice of Intent to prepare an EA/FONSI was published in the Federal Register on August 14, 2008.

In September 2008, information was sent to over 100 federal, state, and local government agencies requesting their participation in the project as Cooperating or Participating Agencies under Section 6002. Responses were received from almost 30 agencies, including the US Coast Guard, Army Corps of Engineers, and the National Park Service. At the same time, invitations to join the Section 106 process as a consulting party were sent to over 30 federal, state, and local historic preservation interest groups and Native American tribes. A number of

these groups expressed an interest in consulting on the project and have been involved throughout the process; **Appendix P** contains a list of consulting parties.

During the fall of 2008, the Project Advisory Group (PAG) was formed and its members were recommended by local officials in Milton and Madison. The PAG met for the first time in October 2008. This meeting served as a kick-off event to introduce PAG members and the communities to the key tasks of the bridge rehabilitation/replacement project.

6.2 Data Collection & Project Needs

The second and third PAG meetings (November & December 2008) were spent reviewing initial traffic and transportation data collected. PAG members and other attendees were asked to comment on the importance of the bridge and what the project should accomplish, assisting in the development of the Purpose and Need. At these early meetings, attendees suggested new bridge location alternatives to be considered.

Once an initial outline of the project purpose was developed, this was sent to Section 6002 Agencies for review and comment in December 2008. Replies were received from five agencies and will be included in the administrative record for the project.

Based on public and agency input through these venues, a Purpose and Need Statement for the project was written. The existing transportation-related conditions in the study area were documented in the *Needs and Deficiencies Report*. In February 2009, both of these draft documents were circulated through Section 6002 agencies for comments. Eight responses were received and incorporated into the final version of the documents; copies of the correspondence will be included in the administrative record for the project. The *Needs and Deficiencies Report* was made available to the public through the project website. The public was offered an opportunity to comment on the Purpose and Need statement during Public Meeting 1 held February 12, 2009.

6.3 Development of Alternatives

PAG meeting #4 in January 2009 gave the project team an opportunity to share preliminary data on the location alternatives identified at previous PAG meetings. At this point, nine potential new bridge locations had been suggested. The team also previewed the bridge type selection exercise that would occur at the upcoming public meeting.

The first public meeting for the project was held February 12, 2009, at the Brown Gym in Madison. At this event, stations were set up to share information on the Purpose and Need, the Section 106 consultation process, and the initial Location Alternatives. Surveys were distributed to gauge public opinion regarding the project purpose and the initial location alternatives. Bridge Type Selection polling occurred at this meeting, recording aesthetic preferences of PAG members, consulting parties, and the general public. A comprehensive record of this meeting – including display materials, presentations, and surveys returned – is on file with KYTC and INDOT.

An initial meeting for Section 106 consulting parties was held the same day as the first public meeting to encourage parties to attend the public meeting and participate in the polling session.

At the time of the first public meeting, 14 of the 16 alternatives discussed in Chapter 3 had been developed and entered into the alternatives evaluation phase. In February, Section 6002

agencies were provided with a list and description of these alternatives and were asked for any comments and input.

6.4 Alternatives Evaluation Process

Opportunities to provide input on the evaluation of alternatives were provided to PAG members, Section 6002 agencies, and Section 106 consulting parties. The results of these coordination efforts were used in the development of the *Initial Location Alternatives Screening Report*, available on the project website.

The fifth PAG meeting (March 2009) was formatted as a group exercise to get input on the screening of the 14 initial location alternatives. PAG members screened alternatives against the Purpose and Need and against a list of secondary considerations, developed alongside the purpose.

At two different webinars in April, agencies were given an opportunity to discuss and provide input on the alternatives screening process. Agencies were provided with the summary of input received at PAG meeting #5, copies of the draft Purpose and Need Statement, and a worksheet listing the alternatives and screening factors.

At PAG meeting #6 in late April, the results from the Bridge Type Selection were reviewed. The project team also presented an initial subset of alternatives recommended for detailed study, based on input received from agencies, PAG members, and public meeting participants.

In May 2009, copies of the draft *Environmental Overview Report* and draft *Initial Location Alternatives Screening Report* were submitted to Section 6002 agencies and Section 6002 consulting parties for review and comment. Written responses were received from ten individuals and organizations. A webinar for Section 106 consulting parties in late May provided an opportunity for historic preservation groups and individuals to discuss the alternatives screening process.

The second public outreach effort took two formats: an all-day open house in Madison and an online forum. The open house was held on May 19, 2009, at the Visitor's Center. Project team members were available to answer questions and discuss issues in a one-on-one setting with members of the public. The online forum was held June 2, 2009 as a second opportunity to reach out to the communities and provide a more convenient setting for discussion. A comprehensive record of this meeting – including display materials, presentations, and transcript of the forum– is on file with KYTC and INDOT.

6.5 Refinement of Alternatives

Over the summer of 2009, formal involvement opportunities slowed as the project team worked to refine the four alternatives recommended for detailed study. During this time, field visits and environmental surveys were conducted while engineers added cross-sections, alignments, and other detailed features to the corridors.

Once the alternatives for detailed study were identified, a draft Area of Potential Effect (APE) for aboveground historic resources was developed with input from consulting parties. This effort included mailed materials and a meeting in Madison in mid July. Throughout August, consulting parties reviewed materials containing information regarding historic structures within the APE that could be considered eligible for listing in the National Register for Historic Places. At a two-

day workshop in Madison (August 31-September 1, 2009), consulting parties discussed eligible structures and potential effects that could result from any of the remaining alternatives. At this meeting, potential mitigation measures were also suggested by the group. Supplemental materials formally documenting effects on historic resources were submitted to consulting parties for comments following the workshop.

Also during this timeframe, the availability of federal stimulus funding through the Transportation Investment Generating Economic Recovery (TIGER) grant was announced. In light of the deteriorating condition of the bridge, anticipated impacts on Section 4(f) resources, anticipated impacts to the National Historic Landmark District, and the structural displacements associated with other alternatives, the project team decided to pursue TIGER grant funding for the Superstructure Replacement with Minimal Approaches Alternative. The TIGER grant could make adequate funding for a replacement bridge available quickly, a special concern in light of the bridge condition and funding limitations facing both INDOT and KYTC.

In mid August 2009, the PAG met for a seventh time to review the status of ongoing environmental reviews and to discuss the TIGER grant. Later that month, a webinar for Section 6002 agencies gave participants an opportunity to discuss environmental data collection tasks and the direction of the project in light of the TIGER grant.

A third public outreach effort also took two formats: a standard open house in Milton and online forum. The open house was held on September 10, 2009 at the new Milton Elementary School. A presentation covered the refinement of the remaining alternatives and the rationale behind the decision to pursue a TIGER grant. Project team members were available to answer questions and discuss issues following the presentation. Written comments were received from a number of attendees. The online forum was held September 17, 2009, as a second opportunity to reach out to the communities and provide a more convenient setting for discussion. A comprehensive record of this meeting – including display materials, presentations, and transcript of the forum—is on file with KYTC and INDOT.

6.6 Proposed Action

After selecting the Superstructure Replacement with Minimal Approaches as the Proposed Action, coordination activities have continued.

A Mitigation & Aesthetics meeting in October 2009 gave consulting parties an opportunity to discuss direct effects on historic resources, cumulative and indirect effects, and proposed mitigation measures. The cumulative and indirect effects were presented and proposed mitigation measures were discussed. The session also included a discussion on aesthetic elements that should be incorporated into the design of the bridge. Surveys were distributed to poll consulting parties on their preferences for color, portal shape, barriers, and pedestrian railing.

PAG Meeting #8 was held December 10, 2009 and covered the economic cost of the 12-month bridge closure, the ferry operation, and aesthetics. PAG members and public attendees were surveyed to gather input on their preferences for aesthetic elements like truss color, traffic barriers, sidewalk railing, pier shapes, and abutment textures.

A Section 106 meeting was also held December 10th to discuss the economic effects of the 12-month bridge closure, details of the ferry operation, the draft Memorandum of Agreement (MOA), mitigation, and aesthetics. Consulting parties were surveyed to determine their

aesthetic preferences on bridge design elements like truss color, traffic barriers, sidewalk railing, pier shapes, and abutment textures. Discussion items at this meeting will be used to revise the Draft MOA prior to the completion of the NEPA process.

Following the release of this Environmental Assessment, a public hearing will be held in mid January during the 30-day comment period. Comments received during this period will be considered in the decision-making process and incorporated into the final environmental document for this project.



Chapter 7

Sections 110 & 106

Cultural and historic resources are protected by various federal regulations. Most notably, Section 106 of the National Historic Preservation Act requires federal agencies to consider impacts to historic resources from their actions, and to balance preservation needs with the need for the action. The Section 106 process “seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation ... The goal of the consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties” (36 CFR 800.1(a)). Coordination with Section 106 consulting parties began in February 2009 and is discussed in more detail in **Chapter 6**.

For National Historic Landmarks, Section 110 of the National Historic Preservation Act also provides an added level of protection. Section 110 establishes a higher standard of care for undertakings that may adversely affect National Historic Landmarks. The law specifies that projects should “to the maximum extent possible, undertake such planning and actions as may be necessary to minimize harm to such landmark” (Section 110 of the National Historic Preservation Act). Projects should include consideration of all prudent and feasible alternatives that avoid effects on National Historic Landmarks.

Additional information about historic resources in the study area is presented in the *800.11e Report* for the project, available on the project website. As discussed in **Section 4.3.2**, a Phase I Archaeological survey is currently being conducted as part of the study, as the project area is located in a place with potential for archaeological resources. When completed, results will be documented in the *Phase I Archaeology Report*. To protect sensitive archaeological resources, the location of these sites is confidential but the findings will be coordinated with SHPOs in both states.

7.1 Area of Potential Effect

The Area of Potential Effect (APE) is the geographic area within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. Factors considered in delineating the APE include:

- Location of the alternatives
- The potential for ground disturbance, destruction, or property taking

- Locations from which the project may be visible or traffic noise may be audible
- Scale and setting of the project

The APE, developed in consultation with Section 106 consulting parties, covers an area of approximately 7 square miles, roughly centered on the existing US 421 Bridge. **Figure 7.1** identifies the geographic area contained in the APE and its relationship with the National Historic Register Districts and the National Historic Landmark District.

7.2 Identification of Resources

Before assessing impacts, cultural and historic resources within the APE were identified and assessed for eligibility according to National Register guidelines. Prior to conducting fieldwork, architectural historians:

- Conducted research to review published literature and to identify and obtain sources of information pertinent to the history and architecture of Trimble County, KY and Jefferson County, IN
- Reviewed the National and State Registers to identify any listed properties and obtain the relevant documentation
- Examined the historic property survey records and files housed with the Kentucky State Historic Preservation Office (KY SHPO) and the Indiana State Historic Preservation Office (IN SHPO) to obtain any relevant documentation
- Examined historical maps and county histories at the public libraries in Lexington and Bedford, Kentucky and Madison, Indiana

Simultaneously, archaeologists researched archival materials, conducted a sonar survey of the riverbed, ran a predictive model, and performed Phase I field tests to identify areas likely to contain archaeological resources.

Project team historians identified and examined a variety of resources including the Jefferson County Interim Report, the Madison National Historic Landmark nomination, published histories of Trimble and Jefferson Counties, Sanborn maps of Jefferson County, and various publications and articles having a bearing on Trimble or Jefferson counties. As a result of the archival research, it was discovered that three National Register Historic Districts, one National Historic Landmark and 19 individual properties had previously been recorded that fell within the APE.

Project team members performed a historic resources survey in April, June, and July of 2009. Field personnel examined the APE, taking photographs of the project area for evaluation of the area's land use and setting of architectural resources. Historians examined and documented the current conditions of the previously recorded sites and documented a total of 79 sites within Kentucky and 212 within Indiana.

As discussed in **Section 4.3.2**, a Phase I Archaeological survey is currently being conducted as part of the study, as the project area is located in a place with potential for archaeological resources. When completed, results will be documented in the *Phase I Archaeology Report*.

*Milton-Madison Bridge Project
Environmental Assessment*

Individual descriptions of each of the historic properties surveyed within the APE are presented in the *Eligibility Findings Report*, available on the project website. Properties in the National Historic Landmark District were not examined as a part of this project because documentation was completed in 2006 to create the nomination form, which is on file with the National Park Service. Findings regarding eligibility presented in the NHL report were assumed valid for all structures within the National Historic Landmark.

Of the surveyed properties, 74 resources were identified as contributing elements to the Madison Historic District (beyond the National Historic Landmark). A total of 14 of these structures are considered individually eligible for listing on the National Register. One additional site in Madison (the gatehouse at the southern entrance to Clifty Falls State Park) is individually eligible for listing in the National Historic Register but falls beyond the boundaries of the historic district.

Above Ground Historic Resources in Madison

<i>Individually Eligible</i>	<i>Contributing to District</i>	<i>Contributing to District</i>
904 E First Street	1022 Park Avenue	912 East Street
1011 E First Street	1023 Park Avenue	924 East Street
1030 Park Avenue	1027 Park Avenue	1002 East Street
923 Telegraph Hill	1032 Park Avenue	1003 East Street
1204 Telegraph Hill Road	1035 Park Avenue	1007 East Street
620 Spring Street	1443 Park Avenue	1008 East Street
1106 East Street	1460 Park Avenue	1009 East Street
Madison State Hospital	1461 Park Avenue	1015 East Street
122 Fairmount Drive	1466 Park Avenue	1017 East Street
1050 Michigan Road	1467 Park Avenue	1030 East Street
1120 Michigan Road	1486 Park Avenue	148 Fairmount Drive
1034 Park Avenue	Madison Water Works	226 Fairmount Drive
1263 Telegraph Hill Road	105 Ferry Street	305 Fairmount Drive
633 Spring Street, Barn	1054 Telegraph Hill Road	315 Fairmount Drive
	678 Spring Street	206 Maywood Lane
<i>Contributing to District</i>	682 Spring Street	220 Maywood Lane
1002 E Vaughn Drive	539 Aulenbach Avenue	912 Michigan Road
902 Fillmore Street	1000 E Dugan Hollow Rd	1034 Michigan Road
906 Fillmore Street	213 Craven Street	Cedar Cliff Drive, Barn
902 E First Street	214 Craven Street	Cedar Cliff Dr Springhouse
1017 E First Street	944 Walnut Street	Spring Street, Culvert
1013 Park Avenue	948 Walnut Street	536 Spring Street
1014 Park Avenue	966 Saddletree Lane	547 Spring Street
1015 Park Avenue	Saddletree Lane, House	623 Spring Street
1019 Park Avenue	859 East Street	633 Spring Street
1021 Park Avenue		

In Milton, there are three properties considered contributing elements to the Third Street Historic District, all previously listed on the National Register. Five surveyed properties are considered contributing elements to the Hunter's Bottom Historic District, one of which has been previously listed on the National Register. In addition, there are four more properties in Milton that have

- Complete photo and video documentation of the existing bridge (HAER documentation) provided to the National Park Service and Jefferson County Historical Society. This also includes the conversion of Historic Madison's film of the opening of the original bridge from explosive nitrate to regular film.
- Design a new truss superstructure that is reminiscent of the original bridge in shape, profile, complexity, and form to minimize visual impacts.

The 12-month bridge closure period would result in a short term negative economic impact on businesses in the study area due to the short term loss in access between communities. To mitigate this impact, the following measures are proposed:

- Incorporate contractor incentives in the construction contract to help minimize the period of time the bridge would be closed.
- In partnership with the Madison Main Street Program, provide a one-day business planning seminar for local business owners to strategically plan for the closure period.
- Provide programmatic funding for a targeted marketing and advertising campaign focusing on attracting both tourists and local consumers during the closure period, emphasizing historic tourism and commercial enterprise in Madison and Milton.
- Match local funding for a historic preservation officer in Madison for up to two years to further preservation in the historic districts.

Other measures will be included in the MOA to offset indirect effects on the Landmark and Historic Districts. These include the following measures:

- Commit to the Section 106 consultation process for any future US 421 Bridge approach improvement project, regardless of the funding source.
- Reexamine the period of significance for the Madison National Register District, bringing its dates in line with the NHL.
- Amend the Madison National Register District to include eligible properties not listed in the original 1970s nomination form.
- Expand the boundaries of the Third Street Historic District to include other historic structures in the area.

In addition, other mitigation measures for the community have been developed as part of the NEPA process and are included throughout this EA document. Where appropriate, they will be included in the design-build contract.



Chapter 8

Section 4(f)

Section 4(f) of the US Department of Transportation Act protects publicly owned parks, recreation areas, wildlife or waterfowl refuges, and historic sites. By law, a Section 4(f) property may be converted to a transportation use only if there is no prudent and feasible alternative and the project includes all possible planning to minimize harm to the resource. This chapter examines the range of alternatives considered, the effects the Proposed Action creates on 4(f) properties, and measures considered to minimize and mitigate any potential harm.

8.1 Section 4(f) Resources

There are four public recreational facilities in the vicinity of the US 421 Milton-Madison Bridge over the Ohio River that have the potential to be affected by the project. These resources, listed below, are documented and pictured in **Appendix B**.

Jaycee Park, beneath the Indiana bridge approach, provides playground equipment, volleyball and basketball courts, and two picnic shelters near the riverfront.

Madison City Campground, off Vaughn Drive east of Madison, provides RV camping sites with a bathhouse and dump station.

The Boat Ramp in Milton, east of the US 421 Bridge, provides the only public boat ramp for Ohio River access in Trimble County.

The Milton City Park, east of the KY 36-US 421 intersection, provides a baseball field, playground equipment, a multi-use path, and a covered picnic shelter.

In addition to the recreational resources described above, the US 421 Bridge, Madison National Historic Landmark District, Madison Historic District, Third Street Historic District, Hunter's Bottom Historic District, and other individually NRHP-eligible historic structures qualify as Section 4(f) resources.

The National Historic Landmark District in Madison contains approximately 1,800 individual resources that contribute to the district. The district covers a period of significance from 1817 to 1939 and demonstrates historic themes related to its architecture and ethnic heritage. The

2006 National Historic Landmark nomination form, on file with the National Park Service, contains details about themes and contributing historic elements.

The Madison Historic District covers a larger area, including most of the National Historic Landmark District. This district covers a period of significance from 1800 to 1874. It conveys themes of architecture, agriculture, commerce, and transportation. With the consensus of Section 106 consulting parties, the period of significance for the Madison Historic District was extended to 1939 for this project. Of the surveyed properties, 74 resources were identified as contributing elements to the Madison Historic District (beyond the National Historic Landmark). A total of 14 of these structures are considered individually eligible for listing on the National Register.

The Third Street Historic District in Milton lies just north of the Kentucky bridge abutment. The district covers a period of significance from 1850 to 1899 and demonstrates a historic architectural theme. The district contains three contributing structures, all previously listed in the National Register.

The Hunter's Bottom Historic District east of Milton covers a period of significance from 1800 to 1924. It is notable for its themes of architecture, agriculture, exploration/settlement, and commerce. Five properties were surveyed that are considered contributing elements to the Hunter's Bottom Historic District, one of which has been previously listed on the National Register.

Beyond the boundaries of these districts, there is one more individually eligible property in Madison and four more individually eligible properties in Milton.

The Clifty Falls State Park Southern Gatehouse in Madison is eligible under criteria A & C. The gatehouse is an excellent example of an early to mid twentieth century New Deal era project in Jefferson County. It was constructed by the Works Progress Administration (WPA). The one-story cut stone building is topped by a side gable roof covered in wood shingles with a large exterior chimney of cut stone. A cut stone wall also runs along the entryway to the park. The building exhibits integrity as it retains its historic form and much of its original materials.

In Milton, the commercial building at 103 Ferry Street is listed on the National Register as eligible under criteria A & C. The two-story brick building has a hip roof and a bracketed cornice to enhance the front façade. The building is an excellent example of a late nineteenth century building associated with the development of commercial enterprise in Trimble County. The building exhibits integrity as it retains its historic form and much of its original materials.

In Milton, the commercial building at the corner of KY 36 and Ferry Street is listed on the National Register as eligible under criteria A & C. The two-story brick building has a hip roof, continuous stone foundation, and two interior chimneys. Originally, the structure served as a commercial development and the Masonic lodge for the community. The building is an excellent example of a late nineteenth century building associated with the development of commercial enterprise in Trimble County. The building exhibits integrity as it retains its historic form and much of its original materials.

A house along KY 36, identified as WSA-234 for this project, is eligible for listing on the National Register under criterion C. The two-story brick house has a continuous stone foundation, cross gable roof, three chimneys, and one story front porch. The front façade has a projecting cornice

with paired brackets, modillions, and returns. All windows have limestone lintels and sills. The residence is an excellent example of a mid-nineteenth century residence constructed in Trimble County. The building exhibits integrity as it retains its historic form and much of its original materials.

Another house along KY 36, identified as WSA-235 for this project, is eligible for listing on the National Register under criterion C. This one-story brick house has a cross gable roof, a shed porch on the front façade, and interior brick chimneys. The single-leaf entryway has a four-pane transom; all windows are topped by jack arches. The residence is an excellent example of an early to mid-nineteenth century residence constructed in Trimble County. The building exhibits integrity as it retains its historic form and much of its original materials.

The US 421 Bridge itself is also an individually eligible historic resource. The US 421 Bridge has been determined individually eligible under Criteria A & C. The bridge is an excellent example of an early twentieth century truss bridge, as well as being associated with the J. G. White Engineering Corporation, an influential and important bridge builder of that era. Despite its deteriorating condition, the bridge exhibits integrity as it retains its historic form and much of its original material. Letters from the State Historic Preservation Offices (SHPO) in both states regarding the eligibility of the bridge are included in **Appendix E**.

There are no wildlife or waterfowl refuges present within the immediate project area that may be affected by any of the alternatives, including the Proposed Action.

8.2 Programmatic Section 4(f) Use of the US 421 Bridge

The Proposed Action for the Milton-Madison Bridge Project involves the replacement of the existing truss superstructure of the US 421 Bridge over the Ohio River. This project qualifies as a use of a Section 4(f) resource – the bridge itself – and is addressed under the *Programmatic Section 4(f) Evaluation and Approval for FHWA Projects that Necessitate the Use of Historic Bridges*¹.

The Programmatic agreement applies because:

1. The project will replace the superstructure of the bridge using federal funds.
2. The project requires the use of the US 421 Bridge, determined eligible for listing in the National Register of Historic Places based on statements from the Kentucky SHPO and the Indiana SHPO. Letters regarding the eligibility of the bridge from both SHPOs are included in **Appendix M**.
3. The project impairs the historic integrity of the structure through the demolition of the superstructure.
4. The US 421 Bridge is not a National Historic Landmark.
5. Agreement among the FHWA, the two state SHPOs and the Advisory Council on Historic Preservation has been reached through procedures pursuant to Section 106 of the National Historic Preservation Act.

8.2.1 Alternatives Considered

A Section 4(f) property may be converted to a transportation use only if there is no prudent and feasible alternative and the project includes all possible planning to minimize harm to the resource. This section describes the bridge location alternatives considered and applies criteria to determine if any of these meet the guidelines to be prudent and feasible.

¹ Available on the FHWA website at <http://www.environment.fhwa.dot.gov/4f/4fnationwideevals.asp>

Chapter 3 documents the range of alternatives considered for this project and the alternatives screening. Four strategies were identified that could potentially meet the project purpose: No Build, Rehabilitation, Superstructure Replacement, and New Bridge at a New Location, shown in **Figure 8.1** below.

8.2.1.1 Avoidance Alternative

An avoidance alternative is any feasible and prudent alternative that avoids the use of all Section 4(f) resources. To be feasible, an alternative must be constructible as a matter of sound engineering judgment. The criteria to determine prudence is more complex. All 16 of the initial bridge location alternatives developed are conceptually feasible.

According to the *Section 4(f) Policy Paper* published by FHWA in 2005, an alternative is not prudent if

- It does not meet the project's purpose and need
- It leads to unacceptable safety or operational problems
- It leads to severe impacts even after mitigation
- It results in costs of extraordinary magnitude
- It causes unique problems or unusual factors

In addition, if an alternative meets multiple of these factors that cumulatively lead to unique problems or impacts, it is considered imprudent.

Avoidance of all Section 4(f) resources in Milton and Madison is difficult due to the extent of historic districts in both states. The Madison Historic District covers all of downtown Madison, stretching along 3 miles of the Indiana riverfront. To the east, the Hunter's Bottom Historic District covers 7 miles of Kentucky riverfront east of Milton. These two resources make it difficult to construct a cross-river link between Lower Milton and downtown Madison that would avoid Section 4(f) resources. Connections to the west avoid the districts but lead to constructability issues and do not satisfy the community connectivity element of the project purpose.

Five alternatives were dismissed because they would not meet the purpose and need for the project:

- The Rehabilitation Alternative does not address geometric or structural deficiencies and does not improve safety on the bridge.
- The Western Bypass Alternative does not maintain or improve mobility and community connectivity.
- The Clifty Park Alternative does not maintain or improve mobility and community connectivity.
- The Lonesome Hollow Alternative does not maintain or improve mobility and community connectivity.
- The Eagle Hollow Alternative does not maintain or improve mobility and community connectivity.

While the No Build Alternative does not meet the purpose and need, it was carried through the analysis as a comparison point for impacts between other alternatives.

Five more alternatives were dismissed because they would cause severe impacts on the communities:

- The Jefferson Street Alternatives were dismissed because they would have substantial impacts in the heart of the National Historic Landmark District and would divide the community.
- The Parallel Alternative was dismissed because it displaces a large portion of historic Lower Milton and impacts three of the four historic districts.
- The KY 36 Alternative was also dismissed because it displaces a large portion of historic Lower Milton.
- The End of Fulton Alternative was dismissed because it results in excessive costs and environmental consequences; a portion of the ridgeline north of SR 56 would have to be removed in order to meet the navigational clearance over the river and connect safely to SR 56.

As described in **Section 3.2.2**, the Around Milton and Ferry Street Alternatives were combined to form the new Tiber Creek Alternatives. The original Canip Creek A and B Alternatives were combined to form the new Canip Creek Alternative. The six remaining alternatives (No Build, Superstructure Replacement with Full Approaches, Superstructure Replacement with Minimal Approaches, Tiber Creek A, Tiber Creek B, and Canip Creek) were screened against existing Section 4(f) resources to determine if an avoidance alternative exists. **Table 8.1** illustrates the results of this screening; no prudent and feasible avoidance alternative was identified.

8.2.1.2 Least Harm Analysis

When an avoidance alternative does not exist, the alternative that causes the least overall harm to Section 4(f) resources must be selected. This section describes impacts to Section 4(f) resources that result from the six remaining alternatives to determine which would result in the least harm.

Four of the six remaining alternatives lead to a Section 4(f) use within the National Historic Landmark District. Even incorporating design elements and mitigation measures to minimize impacts, any of these four alternatives would result in greater adverse impacts to the National Historic Landmark than the No Build Alternative or the Proposed Action. **Table 8.2** compares the number of direct effects within the National Historic Landmark for each of these six alternatives.

Because the No Build Alternative and the Proposed Action do not require the acquisition of any new right-of-way, they result in fewer Section 4(f) uses. Based upon the above discussion, the Proposed Action would have the least harm on Section 4(f) resources.

8.2.1.3 Findings

The No Build Alternative ignores the basic transportation need for the project: to improve or replace the functionally obsolete/structurally deficient bridge, to improve or maintain cross-river mobility and community connectivity, and to improve safety. Because it does not address the deteriorating structural condition, the No Build Alternative poses serious and unacceptable safety hazards for the future. This alternative necessitates the closure of the bridge to all traffic, estimated to occur between 2020-2025.

The Rehabilitation Alternative was considered but does not address the basic transportation need for the project. The American Association of State Highway and Transportation Officials (AASHTO) published *Guidelines for Historic Bridge Rehabilitation and Replacement* (November 2008) that establishes a protocol for defining when rehabilitation of historic bridges is prudent and feasible based on engineering and environmental judgments. In the case of the US 421 Milton-Madison Bridge, the superstructure condition (showing continual deterioration since the 1997 rehabilitation and rated poor in 2009), the geometry (narrow lanes, inadequate stopping sight distances), and load carrying capacity (based on structural condition and steel fatigue) of the bridge are inadequate and "cannot be improved in a manner that is feasible and prudent." **Appendix N** provides more information on the guidance published by AASHTO and its application to the Milton-Madison Bridge Project. With two 20-foot wide lanes and no shoulders, the existing bridge is seriously deficient geometrically and cannot be widened to safely meet the required capacity for the volume or size of modern vehicles using the bridge.

To build on a new location without using the old bridge, Alternatives 4 through 16 were developed to provide a new Ohio River crossing on a new location. As discussed previously, many of these alternatives were eliminated because they do not address the purpose for the project or were associated with substantial impacts to the natural or human environment. The three new alignment alternatives developed in detail (Tiber Creek A, Tiber Creek B, and Canip Creek) would not necessarily impact the US 421 Bridge itself, but would lead to Section 4(f) uses of other resources including the National Historic Landmark District.

8.2.2 Measures to Mitigate Harm

All possible planning to minimize harm went into the development of the Proposed Action and preliminary design of the replacement superstructure. Based on input from Section 106 consulting parties, PAG representatives, and members of the public, a truss superstructure mimicking the profile of the existing bridge was selected as a replacement. At the February 2009 public meeting in Madison, attendees were polled to determine aesthetic preferences for a new river crossing, selecting between key elements on different truss, cable-stay, and arch bridge types. Two tower cable-stay bridges were preferred by the public; a truss bridge similar in appearance to the existing bridge was preferred by Section 106 consulting parties and was rated "above average" by the public. Additional aesthetic elements such as color, pier shape, and railing options were coordinated with Section 106 consulting parties and PAG members to ensure the replacement truss would be compatible with the historic character of the area.

Stipulations in the Section 106 Memorandum of Agreement also specify that the builder plates on the existing bridge will be removed and publicly displayed (if present on the bridge and

salvageable); the truss will be documented to HAER standards prior to demolition; and the video footage of the 1929 bridge opening will be reformatted to DVD/VHS.

8.3 De Minimis Section 4(f) Use of Jaycee Park

Because of its close proximity to the US 421 Bridge, Jaycee Park would likely be needed as a staging area during the construction of the Proposed Action. This action qualifies as a *de minimis* use of the park as a Section 4(f) resource. A *de minimis* impact finding is appropriate if the transportation use, including consideration of impact avoidance, minimization, and mitigation or enhancement measures, does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).

A *de minimis* finding is appropriate because:

1. Jaycee Park is a publicly owned recreational area located adjacent to the existing highway.
2. There is an absence of an adverse effect on the activities, features, and attributes that qualify the resource for protection under Section 4(f).
 - a. Short term, the amount and location of land within the park that may potentially be used for construction staging will not impair the use of the park area for its intended purpose. If used for a staging area, recreational facilities within the potential staging areas – volleyball courts and a picnic shelter – will be relocated within the park area prior to construction activities.
 - b. Long term, the Proposed Action lies totally within existing state right-of-way; therefore, no land acquisition within the park is required.
3. The Mayor of Madison, as the official with jurisdiction over the resources, concurs that the project will not have an adverse effect to the park, taking into consideration the proposed mitigation measures. This is documented in a letter from FHWA, included in **Appendix M**.
4. The park was not developed with Section 6(f) funding.

8.3.1 Measures to Mitigate Harm

This project will have a *de minimis* impact on the use of the park. This takes into account the following measures to minimize harm.

Prior to bridge construction activities, the project team will complete the following work elements, if the park is selected by the contractor for use as a construction staging area:

- Coordinate with the city to ensure planned sidewalk connections from the new bridge to Vaughn Drive are appropriate for the needs of the community;
- Reconstruct the picnic shelter currently located west of the bridge to Bi-Centennial Park;
- Relocate the volleyball courts currently east of the bridge, constructing two temporary courts west of the basketball court; and
- Improve the existing waterfront access point located approximately 600 feet west of the bridge.

Once the park is no longer need for staging, the project team will:

- Restore the three volleyball courts east of the bridge at or near their current location, reconstructed to the existing condition or better;
- Restore the picnic shelter west of the bridge at or near its current location, reconstructed to the existing condition or better;
- Re-grade the affected parcels to correct existing drainage issues;

- Construct a new riverfront sidewalk 350 feet in length on the north side of Vaughn Drive along the affected parcels;
- Provide a paved parking area beneath the bridge for park visitors;
- Restore the waterfront access point immediately west of the bridge to its existing condition or better; and
- Re-seed grass to restore landscaped elements of the affected parcels.

8.3.2 Coordination and Public Involvement

Public involvement activities and coordination points for the Milton-Madison Bridge Project are described further in **Chapter 6**. The public notice and public hearing for the EA, to be held in January 2010, will satisfy the coordination requirement. Details about potential construction staging areas and 4(f) use of the park were discussed at the December 2009 Project Advisory Group (PAG) meeting and Section 106 Consulting Parties meeting as well.

8.4 Net Benefit Section 4(f) Use of Madison Campground

To minimize mobility and access impacts during the bridge closure, the Madison City Campground will be used for a ferry staging area during the closure period. Taking into account proposed mitigation and enhancement measures, this action qualifies as a net benefit and is addressed under the *Section 4(f) Evaluation and Approval for Transportation Projects that have a Net Benefit to a Section 4(f) property*².

The Programmatic agreement applies to the campground because:

1. The project uses the Madison City Campground, a publicly owned recreational area.
2. The proposed project includes all appropriate measures to minimize harm and subsequent mitigations necessary to preserve and enhance features and values of the property that originally qualified it as a Section 4(f) resource. This is discussed further in **Section 8.4.2**.
3. The Mayor of Madison, as the official with jurisdiction over the campground, concurs with the assessment of the impacts, the proposed measures to minimize harm, and the mitigation necessary to preserve, rehabilitate, and enhance those features and values of the Section 4(f) property; and that such measures will be a net benefit to the Section 4(f) property. This is documented in the letter from FHWA, included in **Appendix M**.

8.4.1 Alternatives Considered

The following alternatives have been considered that avoid the use of the US 421 Bridge over the Ohio River: 1) No Build, 2) Improve the existing bridge without using the Section 4(f) Property, and 3) Build a new bridge at a new location without using the Section 4(f) property.

8.4.1.1 Findings

The No Build Alternative is not feasible and prudent because it would neither address nor correct the transportation need cited as the project purpose, necessitating the proposed project. The purpose of the project is to improve or replace the functionally obsolete/structurally deficient bridge, to improve or maintain cross-river mobility and community connectivity, and to improve safety.

² Available on the FHWA website at <http://www.environment.fhwa.dot.gov/4f/4fnationwideevals.asp>

Improving the bridge without the use of the Section 4(f) property (rehabilitation) was considered but does not address the basic transportation need for the project. The superstructure condition (showing continual deterioration since the 1997 rehabilitation and rated poor in 2009), the geometry (narrow lanes, inadequate stopping sight distances), and load carrying capacity (based on structural condition and steel fatigue) of the bridge are inadequate and “cannot be improved in a manner that is feasible and prudent.”³ **Appendix N** provides more information on the guidance published by AASHTO and its application to the Milton-Madison Bridge Project. With two 20-foot wide lanes and no shoulders, the existing bridge is seriously deficient geometrically and cannot be widened to safely meet the required capacity for the volume or size of modern vehicles using the bridge.

As discussed in the FHWA *Section 4(f) Evaluation and Approval for Transportation Projects that have a Net Benefit to a Section 4(f) property*, “it is not feasible and prudent to avoid Section 4(f) property by using engineering design or transportation system management techniques, such as minor location shifts, changes in engineering design standards, use of retaining walls and/or other structures and traffic diversions or other traffic management measures if implementing such measures would result in any of the following:

- Substantial adverse community impacts to adjacent homes, businesses or other improved properties; or
- Substantially increased transportation facility or structure cost; or
- Unique engineering, traffic, maintenance or safety problems; or
- Substantial adverse social, economic or environmental impacts; or
- A substantial missed opportunity to benefit a Section 4(f) property; or
- Identified transportation needs not being met; and
- Impacts, costs or problems would be truly unusual, unique or of extraordinary magnitude when compared with the proposed use of Section 4(f) property after taking into account measures to minimize harm and mitigate for adverse uses, and enhance the functions and value of the Section 4(f) property.”

To build on a new location without using the Section 4(f) property, Alternatives 4 through 16 were developed to provide a new Ohio River crossing on a new location. As discussed in **Chapter 3**, many of these alternatives were eliminated because they do not address the purpose for the project or were associated with substantial impacts to the natural or human environment. Avoidance of all Section 4(f) resources is difficult due to the extent of historic districts in both states. The Madison Historic District covers all of downtown Madison, stretching along 3 miles of the Indiana riverfront. To the east, the Hunter’s Bottom Historic District covers 7 miles of Kentucky riverfront east of Milton. These two resources make it difficult to construct a cross-river link between Lower Milton and downtown Madison that would avoid Section 4(f) resources. Connections to the west avoid the districts but lead to constructability issues and/or do not satisfy the community connectivity element of the project purpose.

Five alternatives were dismissed because they would not meet the purpose and need for the project:

- The Rehabilitation Alternative does not address geometric or structural deficiencies and does not improve safety on the bridge.
- The Western Bypass Alternative does not maintain or improve mobility and community connectivity.

³ American Association of State Highway and Transportation Officials. (November 2008). *Guidelines for Historic Bridge Rehabilitation and Replacement*.

- The Clifty Park Alternative does not maintain or improve mobility and community connectivity.
- The Lonesome Hollow Alternative does not maintain or improve mobility and community connectivity.
- The Eagle Hollow Alternative does not maintain or improve mobility and community connectivity.

While the No Build Alternative does not meet the purpose and need, it was carried through the analysis as a comparison point for impacts between other alternatives.

Five more alternatives were dismissed because they would cause severe impacts on the communities:

- The Jefferson Street Alternatives were dismissed because they would have substantial impacts in the heart of the National Historic Landmark District and would divide the community.
- The Parallel Alternative was dismissed because it displaces a large portion of historic Lower Milton and impacts three of the four historic districts.
- The KY 36 Alternative was also dismissed because it displaces a large portion of historic Lower Milton.
- The End of Fulton Alternative was dismissed because it results in excessive costs and environmental consequences; a portion of the ridgeline north of SR 56 would have to be removed in order to meet the navigational clearance over the river and connect safely to SR 56.

The six remaining alternatives (No Build, Superstructure Replacement with Full Approaches, Superstructure Replacement with Minimal Approaches, Tiber Creek A, Tiber Creek B, and Canip Creek) were screened against existing Section 4(f) resources to determine if an avoidance alternative exists; no prudent and feasible avoidance alternative was identified. Because the No Build Alternative and the Proposed Action do not require the acquisition of any new right-of-way, they result in fewer Section 4(f) uses, causing the least overall harm on Section 4(f) resources.

8.4.1.2 Locations Considered for the Ferry Dock in Madison

While construction of the Proposed Action does not result in a permanent take within the Madison Campground, this action will lead to an estimated 12-month closure of the bridge, severing access between communities. To reduce the resulting impacts on the communities and historic districts, KYTC and INDOT have agreed to provide a ferry between Milton and Madison during the closure period.

As discussed in **Section 4.2.7**, the 12-month closure of the bridge will result in an estimated \$387,000 per day increase in transportation costs for users (due to longer travel times and distances) if no ferry service is provided. Additionally, the one year closure will lead to estimated losses of 620 jobs and \$54 million in economic output for the three county area (Jefferson County in Indiana and Trimble and Carroll Counties in Kentucky). Providing a ferry service between communities will lessen impacts by preserving connectivity and mobility. With the ferry service, the 12-month closure of the bridge will result in an estimated \$210,000 per day increase in transportation costs. The closure period will lead to fewer losses for the three county area: 517 jobs and \$44 million in economic output with the ferry service. It should be noted that other mitigation measures (e.g. marketing campaign or business planning seminar) may further reduce these impacts. Construction expenditures will bring additional jobs and economic stimulus to the region during the three year construction period.

To run a ferry service, docks will be needed in both communities with adequate storage space for waiting vehicles. Existing docks and ramps with access to the Ohio River were considered first to minimize impacts to the environment. Two sites in Madison were initially considered as candidates for the Indiana ferry dock: the boat ramp between Jefferson and West Streets and the permanently closed boat launch at the end of Ferry Street. For the Kentucky side, the Milton Boat Ramp is the only public facility of its kind in Trimble County. Input from PAG members indicated that the Jefferson Street site in Madison is used heavily for recreational boaters and the Madison Regatta. Ferry launch sites on the same side of the bridge would help optimize performance and safety of the ferry service. Therefore, the Milton Boat Ramp and the Madison Ferry Street sites were selected as the most desirable sites to minimize impacts. (A letter documenting the existing condition of the Madison boat ramp is included in **Appendix M**.)

To avoid use of the campground, the project team considered limiting the ferry staging area to the undeveloped space south of the RV lot. However, this area does not provide adequate queuing/parking space by itself and is subject to flooding during high water events.

As discussed in the FHWA *Section 4(f) Evaluation and Approval for Transportation Projects that have a Net Benefit to a Section 4(f) property*, "It is not feasible and prudent to avoid Section 4(f) property by constructing at a new location if:

- The new location would not address or correct the problems cited as the NEPA purpose and need, which necessitated the proposed project; or
- The new location would result in substantial adverse social, economic or environmental impacts (including such impacts as extensive severing of productive farmlands, displacement of a substantial number of families or businesses, serious disruption of community cohesion, jeopardize the continued existence of any endangered or threatened species or resulting in the destruction or adverse modification of their designated critical habitat, substantial damage to wetlands or other sensitive natural areas, or greater impacts to other Section 4(f) properties); or
- The new location would substantially increase costs or cause substantial engineering difficulties (such as an inability to achieve minimum design standards or to meet the requirements of various permitting agencies such as those involved with navigation, pollution, or the environment); and
- Such problems, impacts, costs, or difficulties would be truly unusual or unique or of extraordinary magnitude when compared with the proposed use of the Section 4(f) property after taking into account proposed measures to minimize harm, mitigation for adverse use, and the enhancement of the Section 4(f) property's functions and value."

8.4.2 Measures to Mitigate Harm

This proposed temporary conversion of the campground to a ferry staging area includes all possible planning to minimize harm, includes appropriate mitigation measures, and the official with jurisdiction agrees in writing.

As outlined in the *2007-2012 Parks and Recreation Master Plan*, the campground is scheduled for a comprehensive renovation, including repairing RV stalls, replacing the bathhouse, and relocating the dump station. To perform these upgrades, the campground will be closed to visitors for up to one year's camping season. This is scheduled to be carried out in fiscal year 2012 by the City of Madison. Correspondence with the City of Madison indicates that this planned improvement to the park is concurrent with the timing of the ferry operation for the

Milton-Madison Bridge Project and the City of Madison would support the temporary use of the Madison Campground for the ferry service during the planned closure.

While the dock itself and primary queuing area will be located south of the campground, this area is prone to flooding. To provide backup queuing space and parking, the project team proposes to pave portions of the campground area, as shown in **Figure 8.2**, and use the facility during the one-year scheduled closure for renovations. Once the bridge is reopened to vehicular traffic, the campground will be restored to better than its original condition by repairing RV stalls, replacing the bathhouse, and relocating the dump station, thus providing a net benefit to the Section 4(f) resource. Temporary pavement/parking improvements will be removed and the planned campground renovations described in the *Parks and Recreation Master Plan* will be completed.

8.4.3 Coordination and Public Involvement

Public involvement activities and coordination points for the Milton-Madison Bridge Project are described further in **Chapter 6**. The public notice and public hearing for the EA, to be held in January 2010, will satisfy the coordination requirement. Details about the ferry service and Section 4(f) use of the campground were placed on the project website in November 2009. The ferry service and its associated use of the campground were discussed at the December 2009 PAG meeting and the Section 106 meeting. Additional information was included in a December 2009 project news release and distributed in the December 2009 project newsletter.

8.5 De Minimis Section 4(f) Use of Milton Boat Ramp

To minimize community impacts during the bridge closure, the Milton Boat Ramp will be used for a ferry staging area during the bridge closure period. This action qualifies as a *de minimis* use of the boat ramp as a Section 4(f) resource. A *de minimis* impact finding is appropriate if the transportation use, including consideration of impact avoidance, minimization, and mitigation or enhancement measures, does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).

A *de minimis* finding is appropriate because:

1. The Milton Boat Ramp is a publicly owned recreational area located adjacent to the existing highway.
2. There will be no adverse effect on the activities, features, and attributes that qualify the resource for protection under Section 4(f).
 - a. Short term, a temporary replacement public boat ramp will be constructed at another location prior to conversion of the existing ramp into a ferry dock. Therefore, the recreational functions of the existing resource will be maintained during construction.
 - b. Long term, the Proposed Action lies totally within existing state right-of-way; therefore, no land acquisition is required.
3. The Mayor of Milton, as the official with jurisdiction over the resource, concurs that the project will not have an adverse effect to the ramp and proposed mitigation measures. This is documented in the letter from FHWA, included in **Appendix M**.
4. The boat ramp was not developed with Section 6(f) funding.

8.5.1 Measures to Mitigate Harm

This project will have a *de minimis* impact to the use of the boat ramp. This includes the following measures to minimize harm.

Prior to bridge construction activities, the project team will create an interim facility to provide public access to the Ohio River for small watercraft. The temporary facility will be located to the west of the US 421 Bridge with access from Cooper's Bottom Road in Milton. This will replace the recreational functions of the existing boat launch, which will be converted to a ferry dock for use during the bridge closure period. This will include:

- Repaving the existing boat ramp parking area
- Constructing a secondary parking lot to the west for additional queuing/parking
- Constructing a covered pedestrian shelter
- Adding a concrete apron, retaining walls, and floating landing that adjusts with the water level so cars can drive onto the ferry
- Creating a walk-on dock for pedestrian passengers
- Constructing additional in-water improvements as necessary (dredging, pile construction, etc.) to provide for safe ferry operation

Figure 8.3 shows a conceptual layout for the ferry area in Milton.

Following the bridge closure period and operation of the ferry service, the existing ramp will be returned to the City for public use as a boat ramp. Once the temporary improvements (secondary parking lot, floating landing, walk-on dock, piles, etc.) are removed, the boat ramp will have improved waterfront access for small boats and a new sidewalk connection to Ferry Street. The existing parking lot will be resurfaced to improve its condition.

8.5.2 Coordination and Public Involvement

Public involvement activities and coordination points for the Milton-Madison Bridge Project are described further in **Chapter 6**. The public notice and public hearing for the EA, to be held in January 2010, will satisfy the coordination requirement. Details about the ferry service and Section 4(f) use of the boat ramp were placed on the project website in November 2009. The ferry service and its associated use of the boat ramp were discussed at the December 2009 PAG meeting and the December 2009 Section 106 meeting. Additional information was included in a December 2009 project news release and distributed in the December 2009 project newsletter.

8.6 Other Section 4(f) Resources

The Proposed Action will not result in a Section 4(f) use of any other public parks, recreational lands, wildlife/waterfowl refuges, or historic sites.

